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DISEASES CAUSED BY BACTERIA AND FUNGI

BIRON, H. (1949.) **Miliary pulmonary abscesses in the horse, due to staphylococcal infection.** *Aust. Vet. J.* **25.** 272-273. 2975

A report of the clinical and P.M. findings in a case of staphylococcal pneumonia in a Thoroughbred horse.—N. WICKHAM.

NEAVE, F. K., DODD, F. H., & HENRIQUES, E. (1950.) **Udder infections in the 'dry period'.** I.—*J. Dairy Res.* **17.** 37-49. [Authors' summary copied verbatim.] 2976

In a herd averaging forty-five to fifty cows in milk, large numbers of infections occurred during the dry period and over half of these developed during the first 3 weeks after the final milking-out of the udder. About 50% of the infections persisted and a like percentage of these produced clinical symptoms within the first 2 weeks of calving, half of them caused by staphylococci.

DAS, M. S. (1949.) **Bovine mastitis—Some observations on the differential and inhibitory media in the isolation of the causal streptococci.**—*Indian vet. J.* **35.** 383-390. 2977

An account of the use of aesculin—crystal violet—blood agar medium.—M. R. DHANDA.

LEISE, J. M. (1948-49.) **The relationship between pH tolerance, virulence, and proteolytic enzymes in bacteria.** I. *Bacillus anthracis*.—*Yale J. Biol. Med.* **21.** 145-160 & 233-244. 2978

LEISE, J. M. (1949.) **The relationship between pH tolerance, virulence, and proteolytic enzymes in bacteria.** II. *Shigella*.—*Ibid.* 313-320. 2979

I. L. carried out experiments with virulent and avirulent strains of *B. anthracis* with a view to showing that virulent bacteria contain a proteolytic enzyme, which allows growth at alkaline pH values at which non-virulent strains cannot grow. For this purpose the organisms were grown in trypsin-containing, alkaline media as well as in various sera, supposed to contain

a trypsin inhibitor. The experiments show that a definite relationship between pH tolerance and virulence seems to exist, yet the mechanism involved in the nature of virulence remains problematic.—E. KLIENEBERGER NOBEL.

II. Using virulent and avirulent strains of *Shigella* it was established that there is a definite relationship between virulence and pH tolerance, and that the latter is associated with the greater production of alkaline-effective proteolytic enzymes by the virulent strains. It is concluded that the virulence of strains of *Shigella* is related to the production of such enzymes. These phenomena have already been shown to occur with *B. anthracis* and may possibly occur with all virulent bacteria.—L. G. DONALD.

MØLLER, C. (1949.) Syrefaste saprofytter som årsag til kastning hos ko. Tuberkulinprøvens specificitet. [Acid-fast saprophytes as a cause of abortion in cows. Specificity of the tuberculin test.]—*Nord. vet.-Med.* **1.** 528-540. [Abst. from English summary.] 2980

A description is given of abortion in a cow considered to be due to a Gram-positive acid-fast bacterium belonging to the genus of *Nocardia* or *Proactinomyces*. The organism is non-pathogenic for the usual test animals, but one cow out of five had a marked reaction with high fever. The organism gives rise to a pronounced sensitiveness to avian tuberculin which persists for about eight months. On P.M. examination, however, it has not been possible to demonstrate any pathological processes or presence of bacteria in the experimental animals.

On referring to laboratory records for the period 1937-49, it was found that of a total of 465 placentas received for examination for tuberculosis, in 56 cases although acid-fast organisms were demonstrated microscopically no tubercle bacilli could be isolated in culture. Eight such placentas came from herds in which no reactors to either avian or mammalian tuberculin had ever been found.

One of these cases, which M. examined more thoroughly, is described in detail. There were no lesions in the uterus six days after the abortion.

OTTOSEN, H. E. (1944.) **Some pathologic-anatomical observations on avian tuberculosis in cattle.**—*Skand. VetTidskr.* 34. 1-25. [In English: Swedish summary.] 2981

The survey by Feldman indicated that avian type infection in cattle—as opposed to that in pigs—will generally give rise to harmless processes mostly localized to mesenteric lymph nodes. Nieberle reported the proliferative nature of pleural and pericardial avian type TB. in cattle. Experimentally, however, it has been possible to produce generalized TB. by infection with avian type tubercle bacilli. The literature dealing with experimental work on the effect of avian type bacilli on g. pigs is briefly reviewed.

A detailed illustrated account is given of five spontaneous cases of avian type TB. in cattle. They are of great interest from the pathological view point, for they demonstrate that on occasion avian infection may produce progressive disease. In one case there was ulceration of the intestine and caseation of lymph nodes; in other cases infection had spread as a form of peritoneal and pleural TB. and with haematogenous dissemination. The lesions were both caseous and proliferative in type. In all five cases avian type tubercle bacilli were isolated from one or more organs.

—J. R. M. INNES.

ANON. (1950.) **Streptomycin in acute miliary tuberculosis. A report to the Medical Research Council.**—*Lancet* 258. 841-846. [Summary copied *verbatim*.] 2982

In 25 cases, acute miliary tuberculosis was treated with streptomycin. The survivors, numbering 14 (56%), have been followed up for over two years. Apart from the 3 patients who died in less than a week, all but 1 showed clinical response to treatment. Uninterrupted recovery took place in 9; 1 recovered from miliary disease but with residual pulmonary tuberculosis; 8 developed meningitis, and 4 of these died; 4 died without meningitis. The miliary lesions in the lungs cleared in 19 of the 21 patients who survived more than two months. The prognosis was much worse in the patients most acutely ill at the start of treatment than in the others: 10 of the 11 deaths, and 7 of the 8 cases of meningitis, occurred among the 16 patients with temperatures of 101°F. or over at the start of treatment. Early diagnosis of meningitis and the conduct of treatment are discussed.

SIGURDSSON, B., & TRYGGVADOTTIR, A. G. (1950.) **Immunization with heat-killed *Mycobacterium paratuberculosis* in mineral oil. II.**—*J. Bact.* 59. 541-543. [Authors' discussion and summary modified.] 2983

The present short report is an addendum to an earlier, more extensive paper [see *V.B.* 20. 130]. In the present experiments smaller doses were used, i.e., from 6 to 0.37 mg. of dried bacteria per sheep. The results obtained were essentially similar to those produced by the larger doses, but the infiltrates at the site of injection were smaller and did not penetrate into the muscle, except very slightly in one case. A small number of apparently intact acid-fast bacteria were found in the lesions of 8 of the 10 sheep employed. The skin sensitivity to avian tuberculin developed at least as regularly, and it lasted approximately equally long, as after the larger doses. The sheep developed complement-fixing antibodies in extremely high titres, which were comparable to those observed after the larger doses. It seems, however, that the titre started to fall somewhat earlier in this series than in the earlier experiments with the larger doses. The possible usefulness of this kind of vaccine for producing resistance to infections with *Mycobacterium paratuberculosis* is being investigated.

LARSEN, A. B., & JOHNSON, H. W. (1949.) **Studies on johnin. VII. Frequency of intradermal testing as related to local desensitization.**—*Amer. J. vet. Res.* 10. 344-346. 2984

These studies were designed to detect the time required to effect "recovery" from local sensitization. It is stated that under field conditions 90 days is generally accepted as the shortest interval at which intradermal tests may be repeated, and that in consequence several years have been required in some herds to achieve a final negative reaction from all the animals therein.

Three grade Jersey steers, about 18 months old and weighing 500 lb., were artificially sensitized by the method previously described [Johnson, H. W., see *V.B.* 16. 12]. A fourth animal of comparable age and weight served as a non-sensitized control and gave negative reactions throughout. On each animal ten sites on each of four areas were selected, and on the same site a standard dose of johnin was injected at 7, 14, 21, or 28 day intervals. On two control areas on each animal a total of 40 separate weekly injections was also given, with a fresh site for each injection.

Where a fresh site was employed each week, approximately 97% of the reactions were

classified as positive (3 mm. and upwards) or suspicious (1—2.75 mm.). With sites re-injected at 7-day intervals there were approximately 55% of positive, 15% of suspicious and 30% of negative (>1 mm.) reactors. At 14, 21 and 28 day intervals prior to re-injections, the percentage rose to 75, 82 and 87 respectively. An injection at one site did not appear, however, to influence the results of either simultaneous or subsequent injections at other sites.—ALASTAIR N. WORDEN.

GORET, P. (1947.) La listériose est-elle une maladie d'avenir? Sur l'étiologie du rouget. [Is listeriosis (*Erysipelothrix* (*Listeria*) *monocytogenes* infection) a disease of the future? Aetiology of swine erysipelas (*E. rhusiopathiae*.)]—*Rev. Méd. vét., Lyon et Toulouse*. 98. 317-321. 2985

In France *Erysipelothrix* (*Listeria*) *monocytogenes* infection has recently been reported in poultry, rabbits, sheep and horses as well as in man. The importance of this new disease is stressed. Epidemiological points in common with *E. rhusiopathiae* infection are discussed. Köbe in Germany has succeeded in setting up swine erysipelas regularly by injecting the organism, together with the virus of infectious gastro-enteritis of swine. The possible significance of this is discussed.—D. LUKE.

PULLAR, E. M. (1949.) Infectious pneumonia of pigs. IV. The relation of lung structure to lobe preference.—*Aust. vet. J.* 25. 262-266. 2986

By dissection of the lungs of 20 pigs, the position of the openings and direction of the bronchi serving each lobe were determined. It was found that the lobes with the highest involvement in infectious pneumonia were those served by bronchi with a horizontal opening and a vertical direction when the animal was standing.

There was no association between lobe preference and differences in lobe volume, or rate of air flow through the principal bronchi.

—N. WICKHAM.

SZYBALSKI, W. (1950.) A comparative study of bacteria causing mustiness in eggs. [Correspondence.]—*Nature, Lond.* 165. 737-734. 2987

Achromobacter perolens and several strains of *Pseudomonas* have been held responsible for a musty odour in eggs. They are all rod shaped Gram-negative bacteria, non-sporulating and motile by a single flagellum. Various biochemical characteristics are also reported. From these studies it is concluded that *Achromobacter perolens* should really be placed in the genus *Pseudomonas*.—E. EDEN.

BRATLIE, O. (1948.) Kolimastitis. [Acute mastitis caused by coliform bacteria.]—*Norsk VetTidsskr.* 60. 241-252. 2988

B. observed for a period of four months 26 cows newly infected with acute mastitis in a herd of 43, a total of 31 quarters being affected. Symptoms, severe in only four cows, were swelling and tenderness in the affected quarter and an abnormal secretion which in the more acute cases was serous and yellow and contained fibrin and pus, but had no pronounced smell, did not coagulate, but became a yellow jelly after keeping for a few hours. Body temperatures rose to 41.8°C. with inappetence, continuing for a week in one case in spite of large doses of sulphathiazole. Only three out of the 31 affected quarters became dry.

It was found that the milking machines used were fitted with teat cups having a high collar, the distance between the upper edge of the collar and the upper, movable part of the teat cup, being 30 mm. The cows were of the Norwegian Red-and-White (NRF) breed which have very small teats and the high collars of the teat cups were considered to have caused hyperaemia and telitis which had favoured bacterial invasion. Bacteriological examination of the teat cups revealed that these were heavily infected with intermediate coliform bacteria; B. therefore considered the infection to have been produced by mechanical means.

When teat cups without collars were substituted no further cases occurred during an observation period of 18 months, and a further control measure was the substitution of a thorough cleaning of the udder with a dry brush and paper towels before milking for the usual method.—F.E.W.

HENRIKSEN, S. D. (1949.) Studies in mucoid *Escherichia coli* I. Dissociation and mutative fermentation. II. Specificity of the mucoid antigen (M-antigen).—*Acta path. microbiol. scand.* 26. 893-902; & 903-916. [In English. Author's summaries slightly amended.] 2989

I. Several mucoid strains of *Bact. coli* were studied with respect to dissociation and mutative lactose-fermentation.

In most cases dissociation from M to S occurs in one step, but one strain produced several intermediate steps between M and S which seemed to produce decreasing quantities of the M-antigen. Spontaneous mutation from R to M was observed. These M-forms appeared to differ from the original ones, and it is suggested that the latter might be MKO or MO forms and the former MR forms.

The same strain split off lactose-negative

mutable strains in old broth cultures. Other mutants produced an alkaline-reaction in lactose-media after initial acidification.

Some M-strains produced two types of colony which differed from each other in size, translucency and color on bromthymol blue lactose agar. The two types were unstable. Some S-strains also produced two types of colony, which appeared to be more stable and which differed from each other in the shade of yellow color of the colonies on the same medium. No constant difference in the acidity produced in lactose media by such variants could be demonstrated.

II. Twelve different strains of mucoid Bact. coll, all from pathological processes, had the same M-antigen (mucoid antigen). This antigen could be separated from the bacteria by centrifugation and/or filtration, and appeared to be a complex polysaccharide. It had a low and uncertain antigenic effect in rabbits, but was highly reactive in tests with immune sera (up to a dilution $1 : 4 \times 10^7$). M-antigens from different strains appeared to have identical antigenic properties.

In spite of the common M-antigen the 12 strains differed rather widely with respect to size and consistency of the colonies, and the degree of capsulation of the rods. Two pairs of strains from the same patients had the same M-antigen. The possible significance of this is discussed.

Whereas dissociation from M to S usually occurred in one step, one strain produced several intermediate colony types in this process, suggesting an analogy with dissociation in *Klebsiella* and in *Diplococcus pneumoniae*.

PELLISSIER, A., TRINQUIER, E., & TROQUEREAU, P. (1948.) Sur une épidémie meurtrière chez les bovidés des environs de Brazzaville due à *Salmonella enteritidis* var. dublin. [A fatal epidemic in cattle caused by *Salmonella enteritidis* var. dublin in the Brazzaville area.] — *Bull. Soc. Path. exot.* 41. 307-318. 2990

A very severe epizootic affecting cattle in the area of Brazzaville and showing the picture of an acute haemorrhagic septicaemia was found to be due to *S. enteritidis* var. dublin. A vaccine was tried with success.

—A. MAYR-HARTING.

I. WAI, W. Y., & STAFSETH, H. J. (1950). Pullorum disease studies in turkeys. III. Studies on the bactericidal and agglutinative properties of serum and plasma of normal and pullorum infected turkeys. — *Poult. Sci.* 29. 319-327. [Authors' summary slightly amended.] 2991

II. WAI, W. Y., & STAFSETH, H. J. (1950.) Pullorum disease studies in turkeys. IV. Blood cells and their response to pullorum infection.—*Ibid.* 328-331. [Authors' summary copied verbatim.] 2992

I. Plasma showed greater bactericidal property than serum. Normal undiluted plasma showed greater bactericidal property than undiluted plasma from infected turkeys with low agglutinating titer. Plasma with a high agglutinating titer showed the best bactericidal action. The normal plasma showed numerous colonies in $1 : 16$ dilution, while the immune plasma showed numerous colonies in $1 : 64$ dilution. These two plasma samples showed little or no growth of bacterial colonies at lower dilutions which indicates that the plasma is bactericidal or bacteristatic at the above dilutions. Plasma from the orally infected turkeys showed a greater bactericidal property than the plasma of the intravenously infected turkeys.

The bactericidal property was destroyed by heating at 56°C . for one hour. Heating the immune plasma at 56°C . for one hour, then removing the particles by centrifugation or by filtration eliminated the substance which causes prozone. Old, deteriorated normal plasma added to the prozone-free immune plasma caused prozone which suggests that the prozone is due to non-specific colloidal particles. Agglutinins, bactericidins and the factor responsible for zone reactions were removed by adsorption of immune plasma and sera with *S. pullorum* antigen.

II. The average number of blood cells in normal turkeys was:

2,600,000 erythrocytes per cubic mm.

12,000 leucocytes per cubic mm.

43% of the total leucocytes were heterophils

51% of the total leucocytes were lymphocytes

1% of the total leucocytes were eosinophils

2% of the total leucocytes were basophils

3% of the total leucocytes were monocytes.

The erythrocytes decreased after administration of *S. pullorum*. There was a sharp rise in heterophils after administration of *S. pullorum*. Lymphocytes did not increase much during the first part of the infection, but gradually increased during the later stages of the infection. The agglutinating titer rose before there was any significant increase in lymphocytes.

HÖKL, J., & PROKŮPEK, K. (1949.) Nakažlivé zmetání hlavně s hlediska diagnostického. [The diagnosis of contagious abortion of cattle.]—*Spisy vys. školy Vet., Brno*, 17. Paper No. 151. pp. 1-39. [French and Russian summaries.] 2993

Data are given on the results of certain agglutination tests in an area of Czechoslovakia. 0.002% of 11,249 cattle reacted at 1:100. 0.08% of 4,447 goats reacted at 1:100. Some other data of other tests are given. At the Prague abattoir 22.6% of 140 horses yielded titres of 1:40; 10.9% titres of 1:80; and 0.7% titres up to 1:160. Of 110 pigs examined 6% yielded titres of 1:40; and 3% titres of 1:80. Economic losses through *Br. abortus* infection in Czechoslovakia are discussed.—E.G.

POLDING, J. B. (1948.) **Research into contagious abortion of cattle, sheep and goats: brucellosis in India.**—*Indian J. vet. Sci.* 18. 115-193. 2994

An account of survey work on brucellosis in India and of the work carried out during the five-year tenure of a research scheme financed by the Indian Council of Agricultural Research. The article is divided into nine sections.

Section I dealt with the distribution of the disease in India in imported and in indigenous cattle, the latter being mostly village cattle of the humid regions. The incidence of brucellosis was rarer in the North-Western tract.

Section II dealt with the comparative susceptibility of the various classes of livestock which was in descending order: European breeds, cross-breeds European \times zebu, indigenous zebu, buffaloes, goats and sheep.

Section III detailed the probable factors responsible for the spread of the disease under Indian field conditions. Correlating incidence with climatic conditions, P. observed that climate and poor hygiene play an important role in the dissemination of the disease. That the presence of moisture favours the spread is supported by an experiment which proved that dry air is more inimical to brucella organisms than moist air.

Section IV dealt with bacteriological examination of some 50 Indian brucella strains which did not differ much in their antigenic structure, sensitivity, virulence and tendency to dissociate. Some 40% of these strains were found to be types intermediate between *Br. abortus* and *Br. melitensis*, thus suggesting that the field strain is indigenous to India.

In Section V methods of diagnosis were described, including experiments to determine the suitable density of the antigen for the tube test and a description of a simple technique for standardizing the density of the antigen for use against reconstituted dried serum.

Section VI dealt with brucellosis in human beings. Although there are few recorded cases of *Br. melitensis* infection in human beings in India, P. considered that the incidence was

probably greater in the south than in the dry north.

Section VII dealt with control by vaccination and hygiene. Control through slaughter of infected animals was not possible because of the religious sanctities common in the country. P. found that the disease eliminates itself in places where cattle live more or less on the ranch system in a sunny arid climate. If, however, segregation of cows due to calve were undertaken, P. considered that control of brucellosis would be more effective.

The utility of imported vaccine strains was studied and their keeping quality under field conditions in India was found to be poor. By means of plate counts P. observed that extreme variations in temperature and shaking of the vaccine containers caused deterioration in the quality. In the light of his investigations P. recommended a technique for the preparation of vaccine. Observations on the results of calfood and adult vaccination on Indian farms were also described.

Section VIII dealt with infectious abortions resulting from causes other than brucellosis. Although epidemic abortions due to infection with *Trichomonas*, *Erysipelothrix* (*Listeria*) *monocytogenes*, *Vibrios*, or *Salmonella* were not identified, abortions in goats caused by small Gram-positive coccobacilli like the short form *Erysipelothrix monocytogenes* were observed.

In Section IX a discussion of the factors causing non-specific abortions was given. The occurrence of such abortions in zebu cattle was rarely observed. The occurrence of obscure epidemics of abortion in buffaloes in extreme rainfall areas was described.—C. SEETHARAMAN.

MOLLARET, P., PREVOT, A-R., & GUÉNIOT, M. (1948.) Premier cas humain d'une maladie ovine: hépatite nécroscante mortelle à "Cl. oedematiens". [*Cl. oedematiens* infection in man.]—*Ann. Inst. Pasteur.* 75. 195-208. 2995

This is a detailed account, including microbiology and histology, of a fatal case of *Cl. oedematiens* infection of man and its relation to "black disease" of sheep.—MALCOLM WOODBINE.

SMITH, L. DE S. (1949.) **Clostridia in gas gangrene.**—*Bact. Rev.* 13. 233-254. 107 refs. 2996

This review is restricted to investigations carried out since the beginning of the Second World War and is limited to human cases arising from war wounds, in which gas gangrene occurred frequently enough to permit valid comparisons. The 20 or so strains of *Clostridium* and their origin are described. The genesis of the infective process is discussed in relation to oxidation-reduction potentials and its subsequent progress

is considered enzymatically. The review includes a short discussion on chemotherapy of gas gangrene and concludes with some notes on the isolation and identification of *Clostridium* spp. from infected wounds.—MALCOLM WOODBINE.

RODERICK, L. M., KIMBALL, A., MCLEOD, W. M., & FRANK, E. R. (1947.) **A study of equine fistulous withers and poll-evil.**—*Bull. Kans. agric. Exp. Sta.* No. 63. pp. 20. [Authors' conclusions copied *verbatim*.] 2997

This study was a fundamental inquiry into the anatomy, pathology, and the etiology of equine fistulous withers and poll-evil. The two processes are pathologically alike. It appears from the dissection of clinical and experimental cases that the process is primarily an inflammation of the supraspinous and supra-atloid bursa respectively. The significant pathological features of this condition are the development of a chronic inflammatory connective tissue bursal sac containing a sero-fibrinous exudate which coagulates but does not liquefy, and necrosis of the ligamentum nuchae and thoracic vertebral spines when the infection invades these structures.

Actinomyces bovis and *Brucella abortus* and suis have been regularly isolated from the lesions of a large number of cases of fistulous withers and poll-evil. The injection of the combined cultures into the supraspinous bursa of experimental horses has produced a bursitis apparently identical with that of field cases. These significant bacteriological findings are in agreement with many field epidemiological observations and indicate that horses acquire these infections through association with infected cattle. Infected horses may disseminate these infections to healthy cattle. From this work it appears, therefore, that most cases of fistulous withers and poll-evil are caused by a complex infection with *Actinomyces bovis* and *Brucella* sp.

EMMONS, C. W. (1950.) **Histoplasmosis: animal reservoirs and other sources in nature of the pathogenic fungus, histo-**

plasma.—*Amer. J. publ. Hlth.* 40. 436-440. [Author's summary slightly amended.] 2998

H. capsulatum has been isolated in culture in our investigations from 5 dogs, 1 house mouse, 47 brown rats, 4 roof rats, 19 domestic cats, 7 spotted skunks, and 1 opossum, and from 6 soil samples collected on farms where rats with naturally acquired *H. capsulatum* infection have been captured previously.

The significance of these observations is not fully apparent but the examination of cats and rats by preparation of cultures is recommended as a method of determining the geographic distribution of histoplasmosis.

LYUBASHENKO, S. Y., & NOVIKOVA, L. S. (1947.) [Lesions in equine leptospirosis.]—*Veterinariya, Moscow*, 24. No. 9. pp. 13-15. 2999

The authors give a detailed account of the pathology of the disease. In most of the affected animals the body is jaundiced, particularly such parts as the abdominal region, eyes, nose, mouth, vagina and rectum. In acute cases, however, such yellow coloration may be slight or absent. When illness has been prolonged the body is cachectic.—F.A.A.

GOPALAKRISHNAN, V. R. (1946.) **A preliminary note on vaccination against bovine contagious pleuropneumonia in Assam.**—*Indian J. vet. Sci.* 16. Part 5. 209-211. 3000

Vaccination of a total of 172 cattle against bovine contagious pleuro-pneumonia was carried out in Assam in 1943. The vaccine consisted of an eighth passage living culture of the organism in Bennett's broth (culture-virus-vaccine). Each animal was vaccinated with 0.5 ml. vaccine subcutaneously, one inch from the tip of the tail. Slight rise of temperature and slight swelling or thickening of the tail at the site of inoculation was observed. The vaccinated animals, with one control, were inoculated with a fresh field strain of virus after about 22 months. The control died, while the vaccinated animals survived.—D. R. UPPAL.

See also absts. 3030 (*E. rhusiopathiae*); 3101 (*Str. agalactiae*, *Staph. aureus* mastitis); 3104 (mastitis); 3127 (*S. dublin* infection); 3168 (coliform bacteria); 3169 (*Listella monocytogenes*); 3180 (report, Canada); 3181 (report, India); 3182 (report, Mauritius); 3183 (book, TB. in cattle); 3184 (German congress on TB.).

DISEASES CAUSED BY PROTOZOAN PARASITES

ROUBAUD, E. (1948.) **Transmission cyclique à Paris de *Trypanosoma congolense* Broden, par des *Glossina palpalis* importées du Congo Belge; xénodiagnostic de l'infection transmise. [Cyclical transmission in Paris of *T. congolense* by *Glossina palpalis* imported from the Belgian Congo.]—*Bull. Soc. Path. exot.* 41. 405-413. 3001**

Adult *G. palpalis* infected naturally in the Belgian Congo were used in Paris to infect a goat. Five out of twenty-six flies had trypanosomes confined to the mouth parts as in *T. vivax* infections, yet the goat developed a fatal febrile condition. Because the parasites were so scarce in the goat's blood and because the available laboratory animals (rats, g. pigs

and rabbits) were not susceptible, xenodiagnosis was attempted, using tsetse flies hatched in the Paris laboratory.

Two flies developed an intestinal infection, therefore *T. vivax* was excluded. In one of the flies there was both intestinal and proboscis involvement with non-flagellate trypanosomes and this confirmed the diagnosis of *T. congolense*.

The author discusses some theories regarding mixed *T. vivax*-*T. congolense* infections.

—JAS. G. O'SULLIVAN.

ROUBAUD. (1950.) Trompe de glossine [*G. caliginea*] infectée par *Tr. vivax*. [Proboscis of *Glossina caliginea* infected with *Trypanosoma vivax*.]—*Bull. Soc. Path. exot.* 43. 133-134. 3002

R. demonstrated living *Trypanosoma* type *vivax* in the proboscis of *G. caliginea*. Numerous crithidia were attached to the inner surface of the labrum, while the hypopharynx was packed with metacyclic forms.

G. caliginea has a limited distribution and work is proceeding to determine its role as a vector.—JAS. G. O'SULLIVAN.

GANAPATI, P. N. (1948.) Cultivation of *Trypanosoma cruzi* in the developing chick embryo. [Correspondence.]—*Nature, Lond.* 162. 963-964. 3003

Inoculations were made on to the chorio-allantoic membranes of 10-14-day-old chick embryos with either the cultural forms of *T. cruzi* or infected mouse blood. When examined from the third day after infection onwards, all stages of the parasite usually found in the vertebrate host were seen.

Whitish opaque granulations were scattered over the entire inoculated area of the chorio-allantoic membrane and sections of the lesions revealed cyst-like masses of the intracellular leishmania stages of *T. cruzi* surrounded by thickenings of ectodermal tissue. Crithidial forms were observed in sections of the membrane five days after inoculation and free extracellular trypanosomes were found in the blood of the embryos after a similar period.

None of the inoculated embryos had so far survived to hatch out.—L. P. JOYNER.

CHANG, S. L. (1948.) Studies on hemoflagellates. IV. Observations concerning some biochemical activities in culture, and respiration of three species of leishmanias and *Trypanosoma cruzi*.—*J. infect. Dis.* 82. 109-118. 3004

A fall in pH values was observed during the first week of incubation of *L. donovani*, *L. brasiliensis*, *L. tropica* and *T. cruzi* cultures. During the second week, the pH rose again.

The oxidation-reduction potentials, which are an approximate index of the partial oxygen pressure, were maintained more or less at the pre-inoculation levels. If the potentials were lowered by bubbling nitrogen into the cultures, growth was suppressed. The effect of contaminating organisms (*Bact. coli*, *B. subtilis*, *S. ellipsoidea* and *L. icterohaemorrhagiae*) on the growth of cultures were also studied. The degree of inhibition by the various contaminants could be accounted for by the changes of E_h and pH produced in the media.

Rapid death of leishmania cultures after the second week of incubation was attributed to the exhaustion of glucose and the inability of the organisms to utilize the intermediate acids formed. On the other hand, cultures of *T. cruzi* containing the slender crithidia and trypanosome forms could oxidize these acids. Using the Warburg manometric technique, all four hemoflagellates oxidized glucose and fructose but not maltose or lactose.—E. EDEN.

POUL, J. (1949.) Diagnostic de la leishmaniose générale canine par la recherche des leishmania dans le mucus nasal et dans le testicule. [Diagnosis of canine leishmaniasis by examination of nasal mucus and testicular tissue.]—*Arch. Inst. Pasteur Algér.* 27. 315-316. 3005

On thirty-three dogs, the two methods of diagnosis described were found to be less accurate than existing methods.

—JAS. G. O'SULLIVAN.

JUNGHER, E. L., & WINN, J. D. (1950.) Field experiments with enheptin-T on the control of histomoniasis (blackhead) in turkeys.—*Poult. Sci.* 29. 462-465. [Authors' summary copied verbatim.] 3006

Preventive (0.05 per cent.) and therapeutic (0.1 per cent.) medication in the mash with Enheptin-T [a proprietary preparation described as a thiametroimidine—Ed. V.B.] was studied under field conditions for the control of histomoniasis of turkeys. On 2 farms on which the natural exposure was intensified by introduction of chickens, the mortality in the medicated groups was zero and 7 per cent., against 15.5 and 35.0 per cent. in the respective controls. On 6 farms with natural exposure from contaminated ranges, the mortality was low in all groups, except in one with 6.0 per cent. in the medicated and 62.7 per cent. in the control group. No evidence of toxicity was obtained in over 1,600 continuously low level medicated turkeys. In therapeutic trials on 3 farms involving 244 clinically affected birds, the mortality ranged from 6.8 to 39.7 per cent. against an expected mortality of 100 per cent.

Immunity to artificial reinfection in continuously treated birds seemed to be of a relatively low order. Enheptin-T showed promising histomorphostatic activity under field conditions.

KAR, A. B. (1949.) *In vitro* action of estrogen on rabbit coccidiae.—*Indian vet. J.* 25. 390-399. 3007

Experiments were conducted to study the *in vitro* action of oestrogen on two species of rabbit coccidian oocysts, those of *Eimeria stiedae* and *E. perforans*. Oestrogen was found to have no direct influence on oocysts of either species for they sporulate after a prolonged period upon removal from the effects of the hormone. The estrogen interferes with the normal oxygenation of the oocysts and thus delays sporulation for a considerable period.

—D. R. UPPAL.

RECEVEUR, P., & THOMÉ, M. (1948.) Nouvel hôte d'*Aegyptianella pullorum* et mensurations de quelques globules rouges d'oiseaux. [A new host of *Aegyptianella pullorum* and measurements of red blood cells of some birds.]—*Rev. Elev. Méd. vét. Pays trop.* 2. 239-243. 3008

See also absts. 3135-6 (trichomoniasis); 3170 (*Endamoeba histolytica*); 3180 (report, Canada); 3181 (report, India); 3182 (report, Mauritius).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

BURNET, F. M. (1950.) The general pathology of virus infections.—*Lancet* 258. 1059-1063. [Author's conclusions slightly modified.] 3010

Virus infection is essentially an intracellular process. For some, but not all, viruses there is a rather elaborate mechanism by which the cell membrane is passed. Multiplication of virus within the cell is in all probability a more complex process than binary fission. The author is strongly inclined toward the view that the virus particle must break down into smaller elements before it can make use of the protein synthetic mechanism of the cell for its own replication. He believes that the further study of this process may throw more light on the protein synthetic mechanism of the cell than any other available experimental attack.

The spread of infection is determined (a) by the range of cells which are susceptible to virus infection and necrosis, and (b) by the anatomical relationship of those cells. Symptoms in virus diseases result from chemical and morphological by-products of the primary cell damage; there is no clear evidence of any toxic products of the virus as such. Recovery and immunity are predominantly determined by the production of antibody. The effectiveness of antibody

The authors record the finding of *Aegyptianella pullorum* infection in the blood of an ostrich, which died in captivity. The ostrich had been kept in contact with poultry carrying the parasite and infestation with *Argas persicus* was common among all the birds.

A series of red cell measurements are recorded for the ostrich, local and imported fowls, ducks and pigeons. The measurements for the indigenous fowls were much smaller than those for imported European fowls.

—D. LUKE.

DIKMANS, G. (1948.) Anaplasmosis.—*Proc. 4th Internat. Congr. Trop. Med. Malar.* 1404-1411. 3009

D. reviewed the present knowledge concerning anaplasmosis, including the causal organism, symptoms and pathology, diagnosis, prenatal infection, prevention and treatment. In discussion on the paper several speakers raised the question of mode of transmission, with particular reference to mechanical transmission by flies.—M. L. CLARKE.

will depend on the concentration in which it is present at the points where it can block the virus before generalisation occurs.

BROOKSBY, J. B. (1948.) The survival of the virus of foot-and-mouth disease in blood at 37°C.—*Brit. J. exp. Path.* 29. 10-19. 3011

The preparation of a crystal violet blood vaccine for cattle involves the inactivation of virulent bovine blood. Using virulent g. pig blood, B. investigated the loss of infectivity at 37°C. after the addition of 0.05% crystal violet.

He found that if the blood was defibrinated the virus was not surviving after 2-3 days, but if the blood was citrated it usually survived for at least 5 days. Other decalcifying anticoagulants also prolonged the survival time and it is suggested that the difference observed is correlated in some way with the presence of Ca ions.

In citrated blood the initial titre of the virus determines the duration of survival of infectivity, but this is also partly dependent on the time at which the blood is collected. Survival is longer in blood collected 24 hours after infection than in blood collected 48 hours after infection, though the titre of the two

samples may be the same. Survival time is also decreased by removal of the blood cells.

—H. H. SKINNER.

RONCATI, G. (1948.) *Citologia dell'ipofisi bovina in gravidanza complicata da afta epizootica. [Cytology of the bovine pituitary gland in pregnancy complicated by foot and mouth disease.]—Ann. Fac. Med. Vet., Pisa. 1. 157-163. [English and French summaries.]* 3012

The histological examination of the pituitary glands of pregnant cattle infected with F. & M. disease (one heifer—2 months pregnant; two cows—8½ months pregnant) revealed no regular or characteristic modification of the gland histology resulting from the infection. There was no evidence that secretion of the granules in the cytoplasm of the chromophile cells was inhibited, even when necrotic foci were present in the gland.—A. T. COWIE.

DOGRA, J. R. (1949.) *A single dose prophylactic vaccination of dogs against rabies. —Indian vet. J. 26. 165-173.* 3013

For controlling rabies D. recommends, among other measures, periodic mass immunization of dogs with a single dose (5—6 ml.) of 25% sheep brain virus suspension inactivated by phenol (0.5%). This method affords protection in mice against intracranial infection with fixed virus as judged by Habel's mouse potency test and Leed and Muench's M.L.D. protection evaluation method.

[The experiments in dogs were rather inconclusive and more trials are indicated.]

—GAJINDAR SINGH.

INNES, J. R. M. (1950.) *Experimental allergic encephalitis and implications regarding the aetiology of demyelinating diseases of man and animals: A review.—Brit. vet. J. 106. 93-103.* 3014

Demyelination can be caused by many divergent factors, but the one that is mainly discussed in this review is the demyelinating disease that may occur after vaccination against rabies, which entails an intramuscular injection of a brain suspension. Experimental data support the theory that the suspension contains a brain antigen which produces an autogenous antibody against myelin. Only brain extracts from animals in which myelin formation had occurred were successful in producing demyelinating encephalitis in other animals.—E. EDEN.

FAZEKAS DE ST. GROTH, S. (1950.) *Influenza: a study in mice.—Lancet. 258. 1101-1105.* 3015

Influenza is not a natural disease of the mouse, but most human strains of virus can

easily be adapted to it. Experimental infection closely parallels the human condition. Virus, dead or alive, adsorbed to the surface of living susceptible cells, is ingested by the cell. All the infective inoculum is taken up by cells, and no virus can be detected during the 'lag period'. Soluble complement-fixing antigen appears in the cells, followed by liberation of infective virus into the air passages. Spread of infection follows the physiological movement of respiratory mucus. Peripheral cells which escape infection with the primary inoculum are not exposed to virus infection at a later stage. The substrate in respiratory secretions is destroyed as soon as the first growth-cycle of the virus is finished, and large amounts of virus are excreted via the trachea. Antibody production starts at the same time in an infected as in a vaccinated animal, but in the first few days all the antibody is used up in neutralizing the still multiplying antigen.

Recognition of influenza in normal mice is easy. The main difference between infection of normal and immune animals is not in the number of infected cells but in the extent to which the virus multiplies.

No method of vaccination protects against infection with the heterologous type of virus. Only that fraction of antibody is immunologically active, *i.e.*, capable of preventing infection, which neutralizes the virus before it can enter a susceptible cell.

Greater protection results from nasal vaccination than from other methods. Nasal administration of an unrelated vaccine, in itself incapable of affording the slightest protection, increases the efficiency of peritoneal immunization 20-100 times. This 'pathotopic potentiation' is effective after all commonly used types of influenza vaccines given by any extrarrespiratory route.—W. R. BETT.

DAS, N. B. (1949.) *Studies on the drying of rinderpest virus.—Indian J. vet. Sci. 19. 5-10.* 3016

Rinderpest virus in leucocytes was not inactivated to any appreciable degree on drying on filter paper over calcium chloride or precipitation with cold acetone. Precipitation with alcohol produced partial inactivation.

The virus present in the spleen tissue was dried without much loss of potency by acetone, acetone and ether and acetone in the presence of phosphates. Drying *in vacuo* over calcium chloride was found to be better than drying by acetone as 0.01 g. of the calcium chloride dried virus was always active while acetone dried virus was not always active in the same dose. The virus dried over calcium chloride

remained potent for 4 months at 4°C., 7 days at 28°C. and for 15 days at 37°C, whereas the acetone dried virus remained potent for only 2 months at 4°C.—P. R. NILAKANTAN.

WINGQVIST, G. (1950.) **The histopathological changes of the central nervous system in canine distemper.**—*Nord. Vet.-Med.* 2. 367-384. [In English. Author's summary modified.] 3017

In the beginning of 1943 a non-typical form of canine distemper, in some clinical and immunological features differing from the former well-known type, occurred in Sweden. It spread quickly and extensively and is still running a very malignant course, frequently characterized by an insidious start and a high rate of mortality.

The present investigation was made in order to discover whether this new, non-typical form also exhibited any particular features in the changes of the central nervous system that might possibly be valuable for differential diagnosis. The material consisted of the brains of about 70 and the spinal cords of about 50 dogs, all of which had had symptoms of disturbances in the central nervous system before they died or had to be killed.

The histopathological picture was characterized by the great variability and the irregular occurrence of the lesions. Three main types of lesions occur: 1. Vascular infiltrations by lymphocytes and plasma cells, 2. Productive vascular changes with hypertrophic and hyperplastic processes in the vascular walls and sometimes a fresh formation of blood vessels, 3. Neuroglial foci with a proliferation of macro- and microglial elements in connection with an injury to the nervous tissue, particularly the white matter. In early stages these foci frequently contain microglial fatty granule cells and ameboid astrocytes. In some more chronic foci a considerable amount of neuroglial fibres can be demonstrated. A marked demyelination is frequently found in the neuroglial foci of the white matter. Any of these three types of lesion can occur alone in a focus, but often combinations thereof are found in the same focus. In many cases the neuroglial reaction dominates the histopathological picture.

Cytoplasmic inclusions have been found in various epithelia in several cases, but no distinct inclusions in nerve cells have been found. On the other hand, acidophil cytoplasmic inclusions in single neuroglial cells occur. Slightly acidophil intranuclear inclusions in regressively changed astrocytic nuclei seem, however, to be considerably more frequent. Sometimes they are also found in ependymal cells.

The different lesions are generally found in certain parts of the brain, and vascular reactions preponderate in the grey matter, while neuroglial reactions prevail in the white matter. The favoured places are the cerebellum pons, and medulla oblongata, especially near the fourth ventricle and its lateral recesses, and the marginal parts of the brain stem. In the spinal cord lesions are fairly frequent, mainly in the white matter. As in the brain, vascular reactions seem to dominate in the grey matter and neuroglial in the white matter.

A disseminated non-purulent leptomenigitis is not uncommon. Often direct contact exists between the meningeal infiltrations and superficial foci of the brain.

The lesions of the central nervous system during the form of canine distemper now described are not of particular value for distinguishing it from the typical form.

MCGAUGHEY, C. A. (1950.) **Feline enteritis in captive leopards in Ceylon.**—*Brit. vet. J.* 106. 71-76. 3018

In the summer months an outbreak of feline enteritis occurred among leopard cubs kept in captivity. A formalin-saline extract obtained from the organs of these animals was injected into healthy ones. As the injected animals did not contract the disease, it is considered that this treatment conferred temporary immunity.

Transmission of the disease by the tissue extracts from the cubs to mongrel cats was successful in several cases. The cats that remained healthy most likely already possessed an acquired immunity.—E. EDEN.

DINTER, Z., & BAKOS, K. (1950.) **Die Pluralität des Virus der klassischen Geflügelpest? [Possible plurality of the virus of fowl plague.]**—*Nord. Vet.-Med.* 2. 62-64. [English summary slightly modified.] 3019

"Virus N", the causative agent of an outbreak in fowls of a fowl pest-like disease in Bavaria (Germany) in the Spring of 1949, was compared with the available virus strains of fowl plague and Newcastle disease. The authors proved a close relationship, from a serological point of view, between the strain N and one of the two strains examined of the virus of fowl plague ("F.P."). No relationship, however, was found between the virus N and the other strain of the virus mentioned ("strain Brescia"), nor between the virus N and the strains of Newcastle disease examined. Hens hyperimmunized with the virus N were proved to be immune, to some extent, against the fowl plague test-strains, while, on the other hand, they did not become immune against the virus

of Newcastle disease. The relationship between the virus N, and the Brescia and FP strains of fowl plague was much the same as between the types B, A and A^b of viruses, in which plurality is established.

FABRICANT, J. (1950.) **Studies on the diagnosis of Newcastle disease and infectious bronchitis of fowls. III. The differential diagnosis of Newcastle disease and infectious bronchitis.**—*Cornell Vet.* 40. 39-48. 3020

This report emphasizes the range of clinical histories that may be presented by flocks in which outbreaks of Newcastle disease or infectious bronchitis have occurred.

In 34 out of 36 cases in which infectious bronchitis was diagnosed on clinical grounds the virus was isolated.

In outbreaks of Newcastle disease the haemagglutination inhibition (H.I.) test may be negative at the outset for up to four days, but in the majority of cases it becomes positive two days after the onset of respiratory symptoms.

Newcastle disease is diagnosed where there is—(a) typical history coupled with positive H.I. tests; (b) positive and negative H.I. tests in different birds of the same flock provided they have not been vaccinated with live virus; (c) a negative or low positive H.I. test followed in 3-4 days by a high positive test.

Infectious bronchitis is diagnosed where there is—(a) a typical clinical history together with negative H.I. tests; (b) no clear cut clinical history, but where there are two negative H.I. tests, three to four days apart.

Positive H.I. titres persist in birds infected with field or vaccine strains of Newcastle disease. In chicks 2-4 weeks old a positive H.I. titre may be due to a passive immunity.

—D. LUKE.

ANON. (1950.) **Outbreak of foreign poultry disease eradicated.**—*Fed. Vet.* 7. No. 3. p. 1. 3021

A consignment of game birds consisting of pheasant, quail, duck and partridge arrived in California by air from Hong Kong. All the partridge were dead on arrival and within a few days of arrival other birds in the shipment began to die.

Laboratory studies indicated that the cause of death was the Asiatic type of Newcastle disease. The potential threat of such shipments to the welfare of the poultry industry is emphasized and the proposed new regulations whereby all imported poultry and game birds will be subject to quarantine and inspection are welcomed. The new regulations will not apply to birds sent from Canada and Mexico.—D. LUKE.

GILLESPIE, J. H., KESSEL, B., & FABRICANT, J. (1950.) **The isolation of Newcastle disease virus from a starling.**—*Cornell Vet.* 40. 93-94. 3022

The trachea, lungs and brain of a 12-day-old starling with symptoms of incoordination and tremors were pooled and examined for virus content. Two out of nine 9-day-old chick embryos inoculated died in three days after inoculation. Passage of allantoic fluid to six embryonated eggs resulted in death of all the embryos at two days.

The allantoic fluid was positive to the red cell agglutination and inhibition tests and neutralized by a known Newcastle disease anti-serum.—D. LUKE.

WILSON, J. E. (1950.) **Newcastle disease in a gannet (*Sula bassana*). A preliminary note.**—*Vet. Rec.* 62. 33-34. 3023

Bacteria free bone marrow from a gannet with signs of severe nephritis was inoculated into a fowl. Symptoms of Newcastle disease followed and the fowl died nine days after inoculation. Passage through four fowls produced typical symptoms in each case.

—D. LUKE.

MARTINI, I., & KOERJANA, R. (1949.) **Newcastle disease (pseudovogelpest). The transmission of the Indonesian virus to embryonated chicken eggs.**—*Hemera Zoa.* 56. 329-333. [In English: English and French summaries. English summary copied *verbatim*.] 3024

For the first time an Indonesian strain of the Newcastle disease virus has been cultivated in the allantoic chamber of the developing chick embryo.

Serial passages on 10-days old embryonated eggs were easily obtained and the concentration of the virus in the embryonic fluids appeared to be considerably high, i.e., up to 20×10^{17} m.l.d. in 1 cm³, with a Hirst titer 1:640 or more.

BEAMER, P. D., & PRIER, J. E. (1950.) **Studies on Newcastle disease. III. Resistance of Newcastle disease virus to certain chemical agents.**—*Cornell Vet.* 40. 56-59. 3025

A variety of chemicals were tested for ability to destroy Newcastle disease virus. Among the substances effective after five-min. exposure were liquor cresolis saponatus 1:400, tincture of iodine 1:100, Lugol's solution 1:1,000 and formalin 2%. After 30 min. exposure 0.5% formalin and 1:50 phenol were effective and among those having no apparent effect after 30 min. exposure was 8% hydrogen

peroxide. The results with quaternary ammonium compounds tested were not consistent.

—D. LUKE.

DOLL, E. R., McCOLLUM, W. H., & WALLACE, M. E. (1950.) **Immunization against Newcastle disease with a virus of low virulence.**—*Vet. Med.* 45. 231-236. 3026

In these studies the B1 strain of virus introduced by Hitchner and Johnston was used. The haemagglutination inhibition test was employed for studying the development of antibody response. Observations were made on chicks five days and five weeks old respectively following intranasal and intramuscular vaccination. In the second group there was a very transient rise in H.I. titre following intramuscular vaccination. Vaccination by the intranasal route on the other hand produced titres of up to 1:640. In the first group the H.I. response was similar by both routes with slightly higher values in the intranasally vaccinated group. The titres did not exceed 1:160.

In many chickens the H.I. titres fell to levels below 1:10 within 4-5 weeks after intranasal vaccination. Chicks vaccinated at three weeks had slightly higher average titres than those vaccinated at under one week old.

The B1 virus afforded little protection when chicks were exposed to virulent virus immediately after vaccination.

Groups of chicks were vaccinated intranasally at 2, 9, 10 and 30 days old. Groups of each age were exposed to virulent virus at 2, 4, 6, 7 and 8 days post vaccination. In chicks vaccinated at two days there was no protection against challenge on second day after vaccination. At four days 80% of this group were protected. In the group vaccinated at sixteen days there was approximately 50% protection against exposure to virulent virus on the second day. Complete protection was not afforded at six days for all age groups, but at seven days all except those vaccinated at two days were completely protected.

Respiratory symptoms are produced in B1 vaccinated chicks of all ages but these are less severe in older chicks. In chicks vaccinated when over one week old symptoms are mild and mortality negligible. When the B1 strain is used in laying hens there is a drop in egg production of 20-50% and normal production is not reached again until 2-4 weeks after vaccination.

Chicks can withstand exposure to virulent virus up to about 11 weeks after vaccination. There is a fairly rapid decline in the H.I. titre in chicks vaccinated with this strain and though

chicks which have lost any demonstrable H.I. titre are still capable of withstanding exposure to virulent virus, many will develop mild respiratory symptoms following exposure. Chicks hatched from the eggs of hens vaccinated as chickens with B1 strain have little or no passive immunity.—D. LUKE.

HITCHNER, S. B. (1950.) **Further observations on a virus of low virulence for immunizing fowls against Newcastle disease (Avian pneumoencephalitis).**—*Cornell Vet.* 40. 60-70. 3027

This paper reports on field trials and additional experimental studies using a virus of low virulence (B1 strain).

Chicks newly hatched from eggs of fowls which had been vaccinated with B1 virus did not possess sufficient passive immunity to interfere with their immediate immunization by the intranasal route. H. emphasizes that this finding is at variance with the results of other workers using a different route of inoculation and the feasibility of day-old vaccination in chicks requires further investigation.

Vaccination of chicks under one week old gave a mortality of 2.06% during the three-week period following vaccination. Vaccination of hens in lay did not have any marked effect on egg production. One group of 15 hens vaccinated as day old chicks were solidly immune one year later.—D. LUKE.

KASCHULA, V. R. (1950.) **A new virus disease of the Muscovy duck [*Carina moschata* (Linn)] present in Natal.**—*J. S. Afr. vet. med. Ass.* 21. 18-26. 3028

The mortality rate was extremely high and one farmer lost 150 out of 200, 120 of which died in three days. Others lost 300 out of 450 and 400 out of 500. At a conservative estimate thousands died in the Durban area, the only district in which the disease was observed. Only Muscovy ducks were affected. Other species of ducks, and geese, fowls and turkeys running with them remained healthy. The chief symptoms were complete loss of appetite, pale legs and beak, a high temperature in the early stages, diarrhoea, thirst and listlessness, and a very marked collapse in temperature after the crisis. In some birds which recovered, a paralysis of the limbs was observed. The incubation period varied from 2-4 days and the course lasted 2-5 days. Ducks of all ages were affected, but younger ducks, particularly those between 2-3 months old, were most susceptible.

On P.M. examination the liver and spleen had numerous yellowish grey pin-point necrotic foci disseminated throughout the substance. The bile was very dark green and the gall

bladder usually full. There was often pulmonary oedema, a catarrhal enteritis and petechial haemorrhages of the heart.

Seitz filtrates proved pathogenic for Muscovy ducks, but not for other species of birds or laboratory animals. The rapid spread

See also *absts.* 3180 (report, Canada); 3181 (report, India).

IMMUNITY

JONES, A. R. (1950.) **Dextran as a diluent for univalent antibodies.** [Correspondence.]—*Nature, Lond.* 165. 118-119. 3029

A dextran fraction known as GL/50/3, having a molecular weight of 75,000, used at a concentration of 1.0-1.5% in a solution containing 0.94% sodium chloride was found to be a satisfactory diluent for univalent antibodies judged by the agreement of results with tests in which bovine albumin was used as a diluent in a thousand group tests; the quality of the agglutinates was also as good as those obtained when bovine albumin was used. However, a lack of latitude as regards the optimum concentration of the dextran makes its use for routine work at present unsatisfactory.

—R. MARSHALL.

RICHTER, W. (1950.) **Immunbiologische und klinische Beobachtungen bei Rotlaufserumpferden. [Immunological and clinical observations in horses used for the production of swine erysipelas serum.]**—*Mh. Vet.-med.* No. 5. pp. 85-91. 3030

It was observed that the formation of antibodies in horses used for the production of *Erysipelothrix rhusiopathiae* antiserum depended on the method of inoculation. 2,000 ml. of broth culture per month nearly always produced high titres.

Up to 16 l. of blood per month could be taken without lowering the quality of the serum if regular weekly doses of 200-300 ml. of broth culture were inoculated.

R. advocates intravenous administration of culture in order to eliminate abscesses and hardening of the skin which are often caused by subcutaneous inoculations. Allergic reactions such as arthritis and endocarditis cannot, unfortunately, be avoided by either method. High temperatures after inoculation seemed to indicate good antibody production, but experiments on a large scale would be necessary to confirm this connexion. In order to maintain a high standard of serum the weight of serum horses should be checked weekly and horses that have lost condition should be given time to recuperate.—E.G.

in a flock is probably through infected drinking water, though it is possible that flies spread the infection, perhaps mechanically. In one outbreak 150 birds survived and were immune when a second outbreak occurred seven months later.—J. O. L. KING.

BALAKRISHNAN, C. S., & YERAVDEKAR, S. N. (1949.) **Blood groups in horses.**—*Indian vet. J.* 26. 86-93. 3031

The authors tested 459 horses for their blood groups using standard stock sera obtained on cross-matching 70 blood samples mostly from Thoroughbreds. The results were: Group A—48, Group B—27, Group O—1, and Group AB—383.

—S. L. MUKHERJI.

KNISELY, M. H., BLOCH, E. H., BROOKS, F., & WARNER, L. (1950.) **Microscopic observations of the circulating blood of nine healthy normal horses, all of which had unagglutinated circulating blood cells and high *in vitro* erythrocyte sedimentation rates.**—*Amer. J. med. Sci.* 219. 249-267. [Authors' summary copied *verbatim*.] 3032

Nine carefully selected healthy horses have had unagglutinated circulating blood cells.

Blood from each has shown the high *in vitro* sedimentation rate, well known to be common to samples of horses' blood.

Trauma to 1 healthy horse caused microscopically observed precipitation and agglutination of blood passing through vessels in and near the sites of the trauma.

Trauma to 1 other horse caused precipitation and agglutination of masses, many of which were sufficiently hard and rigid to remain intact while being carried around and around within the horse's circulatory system.

It is necessary to keep horses protected from mechanical trauma, if the unagglutinated blood of living healthy horses is to be seen by microscopic study.

The high *in vitro* sedimentation rate of blood from healthy horses cannot be used as evidence with which to minimize the importance of the damage done to living human patients by sludged blood.

WALLENSTEIN, W. (1949.) **The Rh factor in thoroughbreds.**—*M[ich]. S[t]. C[oll]. Vet.* 10. 35 & 38. 3033

An Rh-like substance was isolated from two mares which produced jaundiced foals. Its classification, although not complete, suggests

that this antigen belongs to a new Rh-like category. A diagnostic serum was prepared and successfully employed in the prediction of sensitization in two mares 30-60 days before their foals were born.—J. A. NICHOLSON.

Speakers.—COOMBS, R. R. A., HOLMAN, C. A., HEARD, D. H., MYNORS, L. S., ALSTON, J. M., MOLLISON, P. L., MOURANT, A. E., & ROBERTS, G. F. (1950.) **Discussion: Haemolytic disease of the new-born.**—*Proc. R. soc. Med.* **43.** 347-354. **3034**

The general problems of iso-immunization were discussed by Coombs. What was so surprising was not that in some conditions the antibodies reached the young and caused haemolytic disease and other complications, but the manner in which this process was prevented from operating in most cases. The relationship of permeability of the placenta to foetal antigen in different species of animals was mentioned. In order to investigate the various stages, an attempt was made to produce experimentally a syndrome of iso-immunization. Such experiments with rabbits were discussed by Heard and those with rats by Mynors. Holman, however, restricted himself to clinical findings in human beings. Other speakers raised minor points, mainly in connexion with the various components of the Rh antigen.—E. EDEN.

BRITTON, J. W. (1950.) **A method of handling hemolytic icterus of newborn foals.**—*J. Amer. vet. med. Ass.* **116.** 345-347. **3035**

This is a disease caused by the ingestion by the foal of haemagglutins from the colostrum of a sensitized mare. If post-natal blood typing shows any foals to be susceptible to this, they should be muzzled and fed milk from another source for the first 48 hours, as the bulk of antibody transfer from colostrum occurs at this time. Meanwhile, the mare should be milked out regularly. The foal is then allowed to suck, but a careful watch should be kept for any symptoms of haemolytic icterus. This regime on a limited number of cases was successful.—E. EDEN.

GOVINDAN NAYAR, K. N., NAMBIAR, K. T. K., & SASTRY, G. A. (1949.) **Blood groups in sheep—Part I.**—*Indian vet. J.* **35.** 408-417. **3036**

An attempt was made to classify blood of sheep into different groups on the basis of iso-haemagglutination reactions. The authors suggest division into the following groups:—

I. (a) Sera strongly agglutinating almost all cells.

(b) Sera strongly agglutinating all the cells including its own and cells agglutinable with almost all sera.

II. Cells agglutinable but serum not agglutinative.

III. Cells not agglutinable but serum agglutinative.

IV. Cells not agglutinable and serum not agglutinative.

—J. M. LALL.

PEERS, J. H. (1950.) **Allergic encephalitis and its possible relationship to human disease.**—*Amer. J. clin. Path.* **20.** 503-514. [Author's summary copied verbatim.] **3037**

Allergic encephalitis is an inflammatory and degenerative process in the brain of animals produced by the parenteral injection of homologous or heterologous brain tissue. It is characterized clinically by ascending paralysis and high mortality, and pathologically by venous dilatation, perivascular infiltration and intense circumvenous microglial proliferation and leukocytic infiltration with partial demyelination of included white matter. Both clinically and pathologically the experimental disease bears considerable resemblance to human post-vaccinal encephalitis, but is much more acute than multiple disseminated sclerosis and lacks the characteristic late scarred stages. Incorporation of the brain tissue for injection in the Freund adjuvant, water-in-oil emulsion with acid-fast bacilli, greatly increases the speed and regularity with which the encephalitis can be produced. The role played by the ingredients of the Freund adjuvant, and the reaction of various types of brain tissue and brain extracts has been discussed. It appears that the encephalitogenic factor is somehow connected with the phosphatide fraction of brain tissue. It is water-soluble, can be removed from rabies vaccine by treatment with calcium acetate, and is dialysable through a cellophane membrane.

BERGSTRAND, H. (1950.) **The pathology of hypersensitivity reactions in man.**—*Brit. med. J.* Jan. 14th. 89-92. **3038**

The production and the characteristic features of anaphylactic shock and bacterial hypersensitization are described. The differences between these two types of reaction are discussed. Drug sensitization seems to show some of the characteristics of both these groups.

The role of capillary damage and connective tissue changes in these conditions are also discussed. A plea is made for more correlation between clinical, serological and pathological studies; this may reveal that many clinical syndromes are a type of anaphylactic reaction.

—E. EDEN.

ØRSKOV, J., & ANDERSEN, E. K. (1948.) **Some animal experiments on the influence of**

sanocrysin on hypersensitiveness.—*Acta path. microbiol. scand.* **25**. 743-745. [In English.] **3039**

Using g. pigs or rabbits the authors found that under suitable conditions sanocrysin [a

See also absts. **3000** (pleuro-pneumonia); **3013** (rabies); **3026-7** (Newcastle disease); **3185** (book, immunology).

PARASITES IN RELATION TO DISEASE [GENERAL]

KOUTZ, F. R., & REBRASSIER, R. E. (1948.) **Identification and life cycles of parasites affecting domestic animals.**—*Columbus: The Ohio State University Press*. pp. 104. **3040**

Brief descriptions of the simpler techniques are followed by a series of photographs and life-history diagrams of the common protozoa,

helminths and arthropods parasitic upon domestic animals.

While the inclusion of a few structural diagrams would have been a great improvement, the authors have largely succeeded in presenting a useful aid to diagnosis for the practitioner.

—L. P. JOYNER.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

MACLEOD, J. (1949.) **The climatology of blowfly myiasis. II. Oviposition and daily weather indices.**—*Bull. ent. Res.* **40**. 179-201. [Author's summary slightly modified.] **3041**

Records of oviposition by blowflies on test groups of sheep, over a five-year period, were examined for relation between the rate of oviposition per day and the conventional meteorological indices of daily weather conditions. There was a definite correspondence with the maximum shade temperature for the day. The relation was not straight-line, the slope changing at between 18 and 20°C. The association with the minimum temperature was not significant. Insolation, as measured by the difference between maximum temperatures in the sun and shade, was positively associated with oviposition.

The humidity indices—evaporating power of the air and the saturation deficit—and the ratio of the daily totals of rain and evaporation, showed a low correlation; the rainfall correlation was barely significant. The association was in no instance statistically reliable.

For given temperatures, higher insolation was associated with greater oviposition. This intereffect was not affected by the rain factor. High saturation deficit and high evaporation were similarly positively associated with oviposition, but the evaporation effect was found to be true only for days when rain fell. Variation of the precipitation index or of the precipitation/evaporation ratio appeared to result in temperature having differential effects; the optimum temperature was apparently lower with the lowest P or P/E value than with higher categories.

The hypothesis is tentatively offered that oviposition, for standard conditions of stimulus,

is primarily associated with temperature, the regression of daily total oviposition on the maximum temperature being approximately linear between 13° and 26°C. Desiccating effects normally cause curvature of the regression at temperatures above 20°, the optimum maximum temperature becoming less with decreasing available moisture, expressible as daily P/E. For given air-temperature and moisture conditions, the level of response is positively associated with intensity of insolation as measured by the difference of daily maxima of sun and air temperatures.

ULLYETT, G. C. (1950.) **Pupation habits of sheep blowflies in relation to parasitism by *Mormoniella vitripennis*, Wlk. (Hym., Pteromalid).**—*Bull. ent. Res.* **40**. 533-537. [Author's summary copied verbatim.] **3042**

The depth and habits of pupation, shown by the three main species of sheep blowflies (*Lucilia sericata*, *Chrysomya chloropyga*, and *C. albiceps*) are discussed in relation to parasitism by the Pteromalid, *Mormoniella vitripennis*.

Experimental series showed that the majority of *Lucilia* larvae pupate in situations which are inaccessible to the parasite, a result which agrees with field observations; whereas the two species of *Chrysomya* have a large proportion of their pupal populations exposed freely to attack by the parasite. The degree of protection thus sought by the larvae appears to be directly proportional to the suitability of the puparia of the species as hosts for the parasite.

Because of this difference in pupation habits, a large proportion of the *Lucilia* population which survives the competition for food and the predatory attacks of *C. albiceps* on the carrion will produce adult flies; whereas the

more exposed *C. albiceps* and *C. chloropyga* populations will be further reduced and in a proportionate manner by parasitism. This explanation is put forward as one of the main reasons for the comparative success shown by field populations of *Lucilia* and the unexpectedly small field populations observed in the case of *C. albiceps*.

It is pointed out that this phenomenon is a disadvantage where natural control of the primary flies is concerned since *C. albiceps* is an important controlling factor in larval populations of *Lucilia*.

SONI, B. N. (1949.) **The relationship between the distribution of the ox warble-fly (*Hypoderma lineatum* de Villers) and soil moisture in India.**—*Indian J. vet. Sci.* 19. 15-18. 3043

From his laboratory observations S. concluded that the optimum soil moisture for the development of *Hypoderma lineatum* in its pupal stage varies from 1-5%, while a soil moisture of 15% and over is detrimental to development. The incidence of *H. lineatum* in different localities depends on the moisture content of the soil.—H. S. DHILLON.

WESTERMARCK, H. (1947.) **The warble fly and some experiences got in the fight against warble fly larvae with gammexane, DDT and derris products.**—*Skand. VetTidskr.* 37. 677-690. [In English.] 3044

The larvicide used to kill ox warbles must be introduced to every warble hole; it is not sufficient to smear it over the whole surface of the animal's back. Where only a few warbles are present, it is best to extract the larvae with a crochet hook and forceps, but if, however, the infestation be greater than about ten per animal, either derris or a 10% solution of benzene hexachloride in xylol should be applied.

—G. B. S. HEATH.

UNSWORTH, K. (1949.) **Observations on the seasonal incidence of *Oestrus ovis* infection among goats in Nigeria.**—*Ann. trop. Med. Parasit.* 43. 337-340. 3045

Continuing previous studies [See V.B. 19. 667], 800 goats were examined between Aug., 1948, and Aug., 1949. Peaks in the incidence of infestation were observed in Sept. and in June, the latter being the greater. The period over which the observations were made was too short for any definite conclusion on seasonal incidence to be drawn, but the previous finding that May and June represented the period of greatest fly activity of *O. ovis* was confirmed.

A higher proportion of mature larvae found during June suggested that, of the larvae

deposited in the nostrils during the period of greatest fly activity, some develop to maturity in 1-2 months, while others remain as first-stage larvae for a longer variable period.

A considerable number of flies must have emerged in a relatively short time during March-May to account for the subsequent increase in infestation rate. Since only a small number of mature larvae were found during the period Nov.-May, it would appear that the flies responsible for this sudden increase must have emerged from pupae which had accumulated on the ground. It is suggested that pupal development may be retarded during the months of the dry season immediately preceding the period of greatest fly activity.

—L. P. JOYNER.

MOGGRIDGE, J. Y. (1949.) ***Glossina pallidipes* and open country in the coastal area of Kenya.**—*Bull. ent. Res.* 40. 43-47. [Author's summary copied verbatim.] 3046

Glossina pallidipes does not readily attack objects moving along the edge of vegetation forming its habitat; fewer tsetse attack under humid than under dry conditions, but those that do seem to range further.

Parties of men moving out of heavily infested thicket did not carry tsetse far into the open. Few tsetses attached themselves to the men and these became gorged within a few yards of the thicket edge. Similar results were obtained when bait cattle were used.

Experimental catches in a glade showed, even during the humid season, an extraordinary reluctance on the part of *G. pallidipes* to approach a party moving through the glade even at so short a distance as 8 yards from the thicket, but further experiments showed that a party staying in the glade for a short time made a much larger catch.

WHITESIDE, E. F. (1949.) **An experiment in control of tsetse with DDT-treated oxen.**—*Bull. ent. Res.* 40. 123-134. [Author's summary copied verbatim.] 3047

An experiment to ascertain whether extermination of *Glossina pallidipes* could be brought about by introducing large numbers of DDT-treated oxen into its habitat was carried out in a small isolated block of bush in Tanganyika.

The oxen were sprayed with a solution of 9 per cent. w/v pure DDT and 9 per cent. w/v resin in groundnut oil. It was estimated that when sprayed once weekly about 70 per cent. of tsetse settling on them were killed, and when sprayed twice weekly, about 95 per cent. Oxen so treated were introduced in a numerical superiority of about 6 to 1 over the larger game in the bush, but were fewer than the small game.

After 3 months in which oxen sprayed once weekly were herded in tens in the bush for ten hours each day, the population of female tsetse was reduced by about 70 per cent. After a further 2 months in which oxen sprayed twice weekly were herded in fives a reduction of 80 per cent. amongst the survivors was brought about.

It was calculated that if these rates of decline could be maintained extermination would take 22 months under the former conditions, and about 9 months under the latter. There are reasons, however, for supposing that destruction might take place more slowly as extermination is approached.

It was shown that unless such a measure as this does proceed to extermination it may be largely wasted, for the tsetse population was able to recover its original numbers in a relatively short time after decimation.

The conditions governing the success of this type of measure against tsetse are discussed. Reasons are given for supposing that quicker destruction of *G. pallidipes* is unlikely to be economically attained; on the other hand, it is considered that greater success might well be achieved against *G. morsitans* or *G. swynnertoni*.

MOGGRIDGE, J. Y. (1949.) **Observations on the control of Kenya coast *Glossina*.**—*Bull. ent. Res.* **40**. 345-349. [Author's summary copied *verbatim*.] **3048**

A small reclamation experiment staged in the coral rag thicket under unfavourable conditions proved successful in eradicating *Glossina austeni* and *G. brevipalpis* and in virtually eradicating *G. pallidipes*. Applied with adequate protective clearings, it is thought that the method may prove entirely successful in eradicating *G. pallidipes* as well as *G. austeni* and *G. brevipalpis*. Under both dry and wet season conditions traps prove quite ineffective.

LEWIS, E. A. (1950.) **Tsetse flies carried by railway trains in Kenya Colony.**—*Bull. ent. Res.* **40**. 511-531. [Author's summary copied *verbatim*.] **3049**

Railway trains running through tsetse-infested country between Mombasa and Nairobi in Kenya Colony carry *G. longipennis*, *G. pallidipes* and *G. brevipalpis* on to stock-farming areas beyond the natural limit of the fly belt, thus being largely responsible for outbreaks of animal trypanosomiasis and a reluctance on the part of European, Asian and African settlers to develop the land, affected by this form of fly dispersal, to its full capacity. The country through which the trains travel is described together with an account of a survey of the fly distribution. Tabulated figures are

given of the monthly totals of tsetse collected from passenger and goods trains by teams of fly boys posted at Emali and Sultan Hamud railway stations about 17 and 25 miles respectively outside the fly belt towards Nairobi. More than 24,000 flies were collected over a period of one year and many, not collected by the de-flying teams, were carried up-country even as far as Nairobi, 101 miles from the fly belt. Tsetse were collected from inside passenger trains, but very much larger numbers were taken from the outer surfaces and under-carriages of goods trucks. Reference is also made to the rôle of motor traffic, especially when in convoy, in the dispersal of tsetse.

The incidence of animal trypanosomiasis along the line of the railway is dealt with and the association of the disease with tsetse carried by trains is supported by results of laboratory experiments on the transmissibility of *Trypanosoma congolense*, *T. vivax* and *T. brucei* by the three species of flies concerned.

Bush-clearing on stock farms outside the fly belt will not protect the cattle from infection carried by flies brought by trains but bush-clearing in specified localities of fly concentration in the infested country is recommended as a measure to reduce the numbers now attracted to trains. It is considered that the spraying of trains will bring considerable relief to farmers; but, so far, no suitable spraying apparatus has been devised nor has a reasonably cheap insecticide been found for this purpose.

HADAWAY, A. B., & BARLOW, F. (1949.) **Further studies on the loss of insecticides by absorption into mud and vegetation.**—*Bull. ent. Res.* **40**. 323-343. [Authors' summary copied *verbatim*.] **3050**

Formulations of DDT have been applied to standard mud blocks. Toxicities to *Glossina palpalis* and *Aedes aegypti*, and the proportions of insecticide recovered from an outer layer of approximately 0.1 mm. thickness have been compared.

Absorption of DDT in oil solutions was considerable, and amounts recovered from the outer layer were only from 8-19 per cent. of the total dosage applied. Adsorption of the insecticide from the oil on to mud occurred. There was some correlation between the capillary rise of the solvent and the extent of absorption. Toxicities of the blocks to test insects were low.

Using concentrations of 2 per cent., 5 per cent. and 10 per cent. in power kerosene, there was no increase in the proportion held on the surface. Application of excessively heavy dosages increased the amounts in the outer layers but there was a trend towards greater

absorption, and therefore to greater waste, at the high dosages. Repeated applications similarly built up a larger dosage in the outer layer but did not increase the proportion there.

Emulsions were intermediate between solutions and wettable powders as regards absorption and toxicity.

Up to 77 per cent. of the insecticides applied as wettable powders was recovered from the outer layer, and toxicities were correspondingly high. When benzene hexachloride wettable powder was used there was rapid loss of benzene hexachloride from the surface by volatilisation. After fifteen days the dosage had decreased considerably and the percentage in the outer layer had fallen from over 70 per cent. to 20 per cent.

Loss of DDT by penetration of the carrier oil through the leaf cuticle may occur when an oil solution is sprayed on to vegetation. The extent of penetration varies with different plants. There is an indication that small amounts of DDT are transferred from the inside of treated leaves to other untreated parts of young coffee and Avocado pear plants. Deposits of DDT on leaves exposed to ordinary climatic conditions remained toxic to tsetse flies for a longer period when applied as an emulsion than as an oil solution. Deposits from a water suspension of a wettable powder were washed off readily by rain.

There is some evidence that continuous exposure to sunlight produced some chemical change in, and reduced the toxicity of, DDT deposits applied to glass plates as a solution in kerosene.

HOCKING, B., TWINN, C. R., & McDUFFIE, WM. C. (1949.) **A preliminary evaluation of some insecticides against immature stages of blackflies (Diptera: Simuliidae).**—*Sci. Agric.* 29. 69-80. 3051

Field tests using D.D.T., chlorinated camphene, chlordane, gamma-benzene hexachloride and a pyrethrum-piperonyl butoxide preparation were made against the larvae and pupae of *S. venustum* and other species of simulum. D.D.T. in concentration of one part to ten million parts of water proved superior as a larvicide, but was not toxic to eggs or pupae.

Spraying shallow streams with an oil solution of D.D.T. from an aeroplane, at the rates of 0.26 lb. and 0.48 lb. of D.D.T. per acre, resulted in good control of *Simulium*. However, this method was much more destructive to other animal life in the area than was hand spraying of streams.—W. E. SWALES.

EVANS, G. O. (1950.) **Studies on the bio-nomics of the sheep ked, *Melophagus***

ovinus, L., in West Wales.—*Bull. ent. Res.* 40. 459-478. [Author's summary slightly amended.] 3052

A method is described for studying the life-cycle of *Melophagus ovinus*. The female ked matures in 6 to 7 days and the male in 10 to 11 days. Copulation takes place 16 hours after emergence and the first pupa is desposited by the female about 13 days after its emergence. The second and successive pupae are deposited at intervals of seven to eight days. The pupal stage covers 20 to 26 days (an average of 22.5 days for 28 observations). The life-cycle is completed in 33-36 days. Experimental conditions did not affect the duration of the various stages observed in the life-cycle.

An investigation of the periodic fluctuations in the infestation of a flock of Welsh sheep showed that the degree of infestation is influenced by the transference of keds between the sheep. Before lambing, keds are transferred from hogs to two- to three-year old ewes and, after lambing, from ewes to lambs. The peak infestation of ewes and hogs occurs before lambing. The maximum infestation of lambs occurs before shearing. At shearing the majority of adult keds and pupae are removed with the fleece. Adults surviving after shearing are killed at dipping. Depending on the nature of the dip, re-infestation results from pupae hatching in fleece or by the transference of keds from infested sheep coming into contact with the dipped flock. Keds disappear from the fleece through being devoured by the sheep, by the activity of insectivorous birds and through natural death. The transference of keds between sheep is achieved through contact and occurs readily when the ked is on the surface of the fleece. The vertical migration of the insect in the fleece is controlled by temperature and is not influenced by light.

The distribution of pupal and adult stages of *M. ovinus* in the fleece of lambs, hogs and ewes is given. The position of attachment of the pupae is controlled by the depth of the fleece, deposition occurring on the wool fibres at a point where the temperature is suitable for their development. The age of the sheep influences the distribution of the ked, young sheep being more susceptible than older animals. In a flock, the higher infestation of hogs compared to older ewes may be due to the higher initial infestation of the hogs after dipping. Open fleeced sheep are more susceptible to ked infestation than tight fleeced sheep.

O'FARRELL, A. F., JONES, B. M., & BRETT, G. A. (1949.) **The persistent toxicity under standardised field conditions of pyre-**

thrum, DDT and "Gammexane" against pests of stored food.—*Bull. ent. Res.* 40. 135-148. [Authors' summary copied verbatim.] 3053

The persistent toxicity of films of pyrethrum in P31 oil may endure on suitable surfaces under warehouse conditions for much longer periods than hitherto supposed, but unexplained fluctuations in toxicity may occur.

Within the range 0.8 per cent. to 1.3 per cent. total pyrethrins, the pyrethrum content appears to be only a minor factor in determining the persistent toxicity of such films.

The nature of the surface sprayed is of great importance in determining the persistent toxicity of pyrethrum films in P31 oil, which is negligible on concrete and increases steadily through the following list of surfaces—brick, heavy hessian, light hessian, jute, cotton, and wood; the last-mentioned two being particularly good substrates.

Residual deposits of DDT or "Gammexane" derived from kerosene sprays are of little use on concrete, but appear otherwise little affected by the nature of the surface treated; they give a uniform degree of persistent toxicity on the various surfaces listed.

The treatment of concrete by dusts is suggested. Otherwise no particular practical advantage attaches to the use of DDT or "Gammexane" in dust form, except that the toxicity of the latter may be higher as a dust than as a spray; the persistent toxicity of dusts is not apparently influenced by the nature of the substrates.

There is no apparent advantage other than non-inflammability, attached to the use of DDT in a watery suspension instead of an oil spray.

Both DDT and "Gammexane" are toxic to adults but practically non-toxic to larvae of *Ephestia kuehniella* (and probably other warehouse moths), which are better controlled by pyrethrum films that are effective against larvae as well as adults.

"Gammexane" appears to be somewhat more effective as a stored products insecticide than DDT but more field experience is required to establish this.

FELDMAN-MUHSAM, B. (1949.) Hibernation of *Hyalomma savignyi* (Ixodidae) in Palestine.—*Bull. ent. Res.* 40. 305-306. [Author's conclusions and summary slightly modified.] 3054

Hibernating gorged females of *Hyalomma savignyi* remain alive and begin to lay viable eggs with the onset of favourable conditions in a room in the middle of March and out of doors

in the second half of May. The gorged nymphs hibernate and metamorphose to imagines by the middle of March at room temperature or the middle of June out of doors. The eggs seem to be the most vulnerable stage of the life-cycle and no development into larvae takes place during the winter, out of doors, irrespective of the age of the eggs. At room temperature partly developed eggs continue their development but younger eggs die. The survival of unfed larvae depends on the size of the cluster that the larvae form and on the temperature and humidity. Unfed nymphs can endure winter conditions in sheltered places, but not as well as gorged ones. At low temperature, metamorphosis of nymphs to imagines is unfavourably affected by high humidity, while that of larvae to nymphs does not depend on humidity conditions.

I. MILNE, A. (1950.) The ecology of the sheep tick, *Ixodes ricinus* L. Microhabitat economy of the adult tick.—*Parasitology* 40. 14-34. 3055

II. MILNE, A. (1950.) The ecology of the sheep tick, *Ixodes ricinus* L. Spatial distribution.—*Ibid.* 35-45. 3056

I. Humidity of the herbage, from the mat to the tips of vegetation, has been studied, and the findings are correlated with behaviour of the tick when not on the host. Unfed inactive adults remain in the upper layer of the mat and, when they become active, movement is confined almost wholly to the vertical plane. During the season of activity, the unfed tick travels up to the tips of the vegetation for about five periods of 4-5 days each, or until it finds a host. Although nymphs which engorge in spring develop to adults during the same autumn, they do not engorge until the following spring; about half of them may perish during the first 100 days after emergence.

Engorged females endeavour to make their way vertically downward into moist layers of vegetation; lateral movements are rare, and consist mainly of attempts to find a way around obstacles to downward progression. Predators, more especially the common shrew, eat many of the females before oviposition commences.

II. The short herbage of heavily stocked lowland pastures affords such poor cover that ticks are never able permanently to colonize it. Hills and moorlands, with their deep layers of vegetation, provide the main habitat for *I. ricinus* in Great Britain. Some apparently suitable hill pastures are either tick free or support very few ticks, and theories are put forward to explain this phenomenon.—G. B. S. HEATH.

SCHMID, G. (1949.) Beobachtungen über die Räude der Schweine. [Mange in pigs.]—*Schweiz. Arch. Tierheilk.* **91**. 365-367. 3057

See also absts. 3001-2 (tsetse flies); 3112 (house flies); 3181 (report, India).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

VAN DYCK, F. (1950.) Comment réduire la laderie bovine dans l'Ituri. [Control of cysticercosis in cattle in the Belgian Congo.]—*Bull. agric. Congo belge*. **41**. 437-441. [Flemish summary.] 3058

Figures are given which show the extent of infestation in the Belgian Congo with *cysticercus bovis* and the great economic loss due to infested meat. Three methods of control are discussed, elimination of *Taenia saginata* from infested human beings; efficient sterilization of infested meat; the provision and use of latrines and the adoption of proper sewage disposal to prevent contamination of pastures with gravid proglottids. [The author uses the name *cysticercus cellulose*, so both the name itself is given wrongly and the spelling is wrong.—Ed. V.B.] —ROY MACK.

TODD, A. C., KELLEY, G. W., & HANSEN, M. F. (1949.) Winter survival of sheep parasites on a pasture in Kentucky.—*Bull. Ky. agric. Exp. Sta.* No. 533. p. 7. [Authors' summary and conclusions copied verbatim.] 3059

Infective larvae of the roundworms *Haemonchus contortus*, *Ostertagia circumcincta*, *O. trifurcata*, *Chabertia ovina*, and *Nematodirus spathiger* were found to survive winter on pasture in central Kentucky. The infective larva of the tapeworm *Moniezia expansa* was demonstrated to survive winter within its intermediate host. Evidence was obtained that overwintering larvae on pasture and those worm parasites carried by ewes through the winter, are together sufficient to cause rapid increase in numbers of larvae available to infect lambs and re-infect ewes.

It is recommended that a phenothiazine-salt mixture be available to ewes throughout the grazing season.

THRELKELD, W. L., & JOHNSON, E. P. (1948.) Observations on the pathogenicity and viability of *Ostertagia ostertagi*.—*Vet. Med.* **43**. 446-452. 3060

The authors made comparisons between the blood picture of five calves infected experimentally with *O. ostertagi* and that of uninfected calves. The only significant difference was a decrease in the mean haemoglobin value which occurred in the former group. Pathological lesions as a result of infection occurred in two

A short account on the incidence and symptoms of sarcoptic mange in pigs as observed in Switzerland.—ROY MACK.

calves. One of these was about two months old at the time of infection and received 148,000 larvae over a period of nine months. The other was six months old and received 12,408 larvae over three and a half months. In both these calves there were inflammatory changes in the abomasum and an increase in the percentage of heterophile leucocytes. There appeared to be no correspondence between the degree of infection at the time of P.M. examination and the pathological effect. The viability of larvae of *O. ostertagi* on paddocks in Virginia was found to vary between 4.5 and 6.5 months.

—J. F. A. SPRENT.

KRASNOPEROV, N. P. (1947.) [Onchocercosis of tissues in the horse's hoof.]—*Veterinariya, Moscow*. **24**. No. 3. pp. 22-23. 3061

K. described *Onchocerca* infestation in a hoof of a horse and gave some details of a few examinations he made of hooves of other horses. The worm was found in about 4% of those he examined. The seat was usually in the cartilage; rarely the worms were in the neighbourhood of the coronary band but always adjacent to the large blood vessels. [The author does not give any indication concerning the cartilage affected. It is possible that he refers to the cartilages phalangis tertiae—Ed. V.B.]—F.A.A.

PEREIRA, C., & DE MELLO, M. J. (1948.) Papel da predisposição do hospedeiro na produção da habronemose cutânea ("Esponja") dos equídeos. [Role of host's predisposition in the production of cutaneous habronemiasis ("summer-sores") of equines.]—*Arq. Inst. biol., S. Paulo*. **18**. pp. 363-380. [Abst. from English summary.] 3062

A brief account is given of the literature on the aetiology of "summer-sores" (equine habronemiasis), emphasising conflicting opinions that have been expressed.

A horse, previously known not to have been affected, was exposed in five successive instances, in a fly-proof enclosure, to daily doses of *H. muscae* larvae, deposited on artificial wounds: for 17 days to 200 larvae per day (total 3,400 larvae); for 14 days to 300 larvae per day (total 4,200 larvae); for 23 days to 400 larvae per day (total 9,200 larvae); for 14 days to 500 larvae per day (total 7,000 larvae); and for 9 days to 600 larvae per day (total 5,400 larvae); in all 29,200 larvae. No "summer-sores"

developed and in the course of the succeeding four months culture tests were done with the faeces of this horse in order to demonstrate any *Habronema* larvae that might be present. [For technique, see V.B. 15, abstr. 2476.] No larvae were found.

On the other hand, a donkey, subject to spontaneously recurring sores each summer, was similarly exposed for four periods to daily doses: for 9 days to 300 larvae per day (total 2,700 larvae); for 6 days to 100 larvae per day (total 600 larvae); for 17 days to 75 larvae per day (total 1,275 larvae); and for 10 days to 50 larvae per day (total 500 larvae); in all 5,075 larvae. The first two experiments resulted in the production of typical "summer-sores". In the third experiment the lesion was established, but failed to spread. In the fourth experiment the lesion not only failed to spread but regressed as in the five experiments on the horse. The above cultural technique was carried out with negative results.

The authors concluded that *Habronema* larvae are the inciting agent of "summer-sores", but that the disease may develop in its typical way only if the host has some sort of predisposition.

The dominant gene hypothesis of Howell & Hart (1927)—[An apparent hereditary epithelial defect factor, the possible etiology of bursattee in horses.—*J. Amer. vet. med. Ass.* 71. 347] is discussed in the light of these

experiments. References are also made to recent works on the heredity of human allergy.

A good bibliography is given.

FERRARA, B. (1949.) Su di un caso di infestazione oculare da thelazio in un bovino. [*Thelazia rhodesi* in conjunctival sac in a cow.]—*Zootec. Vet., Milan.* 4. 619-626. [English and French summaries.] 3063

An account of infestation with *Thelazia rhodesi* of the conjunctival sac of cattle.—E.G.

RIEDEL, B. B. (1950.) The effect of caricide on *Ascaridia galli* in chickens.—*Poult. Sci.* 29. 394-397. [Author's summary copied verbatim.] 3064

Chickens infected with *Ascaridia galli* were subjected to treatment with 1-diethylcarbamyl-4-methylpiperazine dihydrogen citrate (caricide). Single oral doses of 1.0 gm. expelled 36.5 per cent. of the ascarids harbored. Two oral doses of 1.0 and 0.5 gm. administered several hours apart were 69.4 per cent. effective. Single and double doses of 0.5 gm. or less were not toxic. Single doses of 1.0 gm. given with or without repeat doses were toxic. This low level of efficiency accompanied by the toxic results following treatment make caricide undesirable for the treatment of ascariasis in chickens. Fasting before and after treatment and purgation following treatment did not increase the drug efficiency.

See also absts. 3129 (*Trichinella* infection); 3171 (nematode egg counts); 3181 (report, India).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

TAFT, E. B. (1949.) Melanin solubility in tissue sections. [Correspondence.]—*Nature, Lond.* 164. 1133-1134. 3065

Treatment of sections of malignant mela-

noma and of negro skin with ethylene chlorohydrin and with pyridine at 22° and 60°C. for periods of 15 min. to 24 hours did not remove the melanin present.—E. EDEN.

NUTRITIONAL AND METABOLIC DISORDERS

HOWIE, J. W. (1949.) Nutrition and susceptibility to infection.—*Brit. J. Nutrit.* 2. 331-337. 3066

A detailed discussion of the literature in this field is presented. The incrimination of any single nutritive factor such as vitamin A has so far been unsuccessful. In several experiments by different workers however, some diets were statistically superior to others in helping the animals to resist or combat experimentally induced infections. As yet it is not known which factors were responsible for this difference.

—E. EDEN.

TYLER, W. J., CHAPMAN, A. B., & DICKERSON, G. E. (1947.) Sources of variation in the birth weight of Holstein-Friesian calves.—*J. Dairy Sci.* 30. 483-498. 3067

This is a report of the statistical analysis of the birth weights of several hundreds of Holstein-Friesian calves. Herd differences accounted for 22%, sex for 7% and calving sequence for 14% of the variation observed. The remaining variation, by far the largest individual factor, was due to heredity. Season or year had little or no effect on birth weight. Male calves were heavier than females and

calves from "first calf" heifers were lighter than were calves from dams of later calving sequence. Inbreeding also tended to reduce the birth weight.—E. EDEN.

TOSIC, J. (1950.) **Microbial digestion in the alimentary tract. Integration of microbial activities from the biochemical standpoint.**—*Advanc. Sci.* 6. 349-350. 3068

The gaseous, aqueous and solid components of the rumen are tabulated and the approximate concentrations of the more important constituents are given. The relation of dietary cobalt to that present in the micro-organisms of the rumen is also discussed.—E. EDEN.

FRANKLIN, M. C., REID, R. L., & JOHNSTONE, I. L. (1948.) **Studies on dietary and other factors affecting the serum-calcium levels of sheep. Parts I to VI.**—*Bull. Coun. sci. industr. Res. Aust.* No. 240, pp. 5-77. [Authors' general summary copied *verbatim*.] 3069

The results of the experiments discussed in this bulletin demonstrate the ease with which the serum-calcium level in sheep can be depressed. Several of the more important factors which may render sheep hypocalcaemic and which have formed the basis of the studies in this bulletin are summarized as follows.

1. Nutritional

Rations which are deficient in calcium and have a wide calcium/phosphorus ratio will readily induce a severe fall in the serum-calcium level when fed to sheep. These have been fed to lactating ewes, sucking lambs, three- and six-month-old weaners, in-lamb ewes, and full-mouthed dry ewes. The hypocalcaemia can be induced most readily in lactating ewes and, with decreasing readiness, in the other classes in the order in which they are named. This is related to the physiological requirements of the animals.

In experiments in which similar groups were fed on wheaten chaff and wheat, maize, or oats, those animals which received wheat grain as the concentrate portion of the ration were least seriously affected.

The addition to calcium-deficient rations of a suitable calcium supplement either as a calcium-rich foodstuff such as leguminous hay or chaff, or as a mineral supplement such as finely-ground limestone, has successfully prevented depression of serum-calcium levels or has restored hypocalcaemic sheep to normal.

It has been shown that fineness of grinding is an important factor in the ability of a limestone supplement to prevent or cure the hypocalcaemia which results from feeding calcium-deficient or unbalanced rations to

sheep. Sterilized bone meal, added in the same proportion to cereal-rich rations, was less satisfactory. Slaked lime was unsuitable. Free access to a lick of equal parts of limestone and salt was less effective than the addition to the feed of finely-ground limestone.

2. A Falling Plane of Nutrition

The influence of fasting, or of a severe reduction of the plane of nutrition, on serum-calcium levels has been studied intensively with pregnant and non-pregnant ewes and with rams. It has been shown that a relatively short period of fasting will induce a large depression in the serum-calcium level but that if the fasting period is prolonged the serum-calcium level subsequently returns to levels as high as, or higher than, pre-fasting values. The absence of drinking water during fasting appeared to aggravate the adverse effects of the fast.

3. Exercise

Field observations have indicated that exercise may precipitate a state of collapse in sheep which are already hypocalcaemic prior to the exercise, and a further fall in serum calcium is associated with this. In the experiments recorded moderate exercise caused an appreciable depression in the serum-calcium level.

4. Sunlight and Vitamin D

A high dietary intake of calcium and phosphorus failed to maintain normal serum-calcium levels in sheep housed in indoor pens. Inadequate dietary vitamin D and lack of ultraviolet irradiation are considered to be responsible, because normal calcium levels were quickly regained after the administration of a vitamin D supplement and subnormal values did not occur among weaners which were similarly fed but were exposed to abundant sunlight.

The results obtained in these investigations have shown clearly that the calcium content of the blood of sheep may be lowered considerably and kept at these low levels for long periods without any evidence of the clinical symptoms usually associated with such sub-normal levels. This applied equally to pregnant or lactating ewes or to dry sheep. However, hypocalcaemic ewes showed evidence of clinical disturbance when exercised whereas ewes with normal serum-calcium values prior to exercise were unaffected. Several instances were observed where serum-calcium values returned to normal while sheep were still in a state of negative calcium balance, indicating that the blood picture is not always a reliable guide to the calcium status of the animal.

Although serum-magnesium and inorganic phosphorus estimations were carried out concurrently with the serum-calcium determinations they have, with only a few exceptions, been omitted throughout these papers since, in general, they revealed no consistent trends and appeared to bear no significant relationship to the serum-calcium levels in these particular experiments.

MCCARTHY, E. F., & McDUGALL, E. I. (1949.) **Absorption of immune globulin by the young lamb after ingestion of colostrum.** [Correspondence.]—*Nature, Lond.* 164. 354. 3070

Using electrophoretic, immunological, and salting-out methods, the authors studied the uptake, by lambs, of globulins from the colostrum of ewes previously immunized against *Salmonella typhi* H. antigen. Whilst some lambs were allowed to suck normally, others were denied access to colostrum for measured intervals after birth. A rapid rise of serum globulin in lambs occurred if immune colostrum was ingested within 29 hours of birth, but not after 48 hours. This rise of serum globulin fell slowly over the next five weeks. A proteinuria was recognized for two days after birth. This could be related to the absorption of the globulin of colostrum.

Immune globulin was shown to be present in colostrum for only a few days before and after parturition.—R. J. FITZPATRICK.

HILL, H. (1949.) **Fütterungsversuche mit Methylthiouracil. [Feeding experiments with methyl thiouracil.]**—*Dtsch. tierärztl. Wschr.* 56. 385-389. 3071

G. pigs and pigs were given daily doses of methyl thiouracil for several weeks. This treatment decreased the growth rate but there was no evidence that it had a favourable effect on the fattening of the animals. Respiratory quotient studies are also reported.—E. EDEN.

SHORLAND, F. B. (1950.) **Effect of the dietary fat on the composition of the depot fats of animals.** [Correspondence.]—*Nature, Lond.* 165. 766. 3072

Comparison of the fat of pasture-fed animals, where the main dietary fatty constituent was linolenic acid, indicated that whereas horse fat contained up to 17% of this constituent, beef and mutton tallow contained little if any linolenic acid. Therefore contrary to current conceptions, certain animal fats are not appreciably modified by the nature of the dietary fat.

—E. EDEN.

BRANTON, C., BRATTON, R. W., & SALISBURY, G. W. (1947.) **Total digestible nutrients**

and protein levels for dairy bulls used in artificial insemination.—*J. Dairy Sci.* 30. 544-545. [Only abst. given; abst. from abst.] 3073

The effect of increasing the total digestible nutrients and the protein content of the diet on the reproductive capacity of bulls was examined. The changes observed were small and the authors do not consider any of them to be of practical significance. Feeding standards for bulls in active service are also given.—E. EDEN.

HEGSTED, D. M., KINNEY, T. D., & CARTAYA, J. A. (1948.) **The effect of low protein and low choline diets on the absorption of iron and copper.**—*Amer. J. Path.* 24. 722. [Only abst. given; abst. from abst.] 3074

Rats maintained on a diet low in protein (8% casein) and low in choline, developed toxic symptoms if they were also given 2.2% ferric citrate. Increase of protein alleviated all the toxic symptoms; additional choline, however, was without effect. Choline favoured the storage of copper in the liver; copper, however, largely prevented the deposition of fat in the liver of rats on choline deficient diets.—E. EDEN.

PALMER, R. C. (1949.) **Some properties of the wool from copper-starved Merino sheep.**—*J. agric. Sci.* 39. 265-273. 3075

Thirty sheep on a tract of cobalt and copper deficient land in Australia were divided into groups of six, which received twice weekly doses of 0, 1, 5, 50 and 100 mg. copper sulphate per sheep respectively. Detailed examination of the fleece from these animals showed that the 5 mg., and greater, doses of copper caused (a) an increase in fibre diameter, (b) increase in ultimate tensile strength, (c) increase in crimp ratio and, probably, (d) a change in the nature of either the wool surface or the wool grease, or both. Copper deficiency led to excessive fibre breakage during carding.—G. B. S. HEATH.

SELLERS, K. C. (1950.) **Swayback in a folded flock of sheep.**—*Vet. Rec.* 62. 134-135. 3076

Swayback occurred in a flock of Suffolk sheep which were maintained by folding over arable crops in Cambridgeshire. Blood copper values were low, and S. suggests that the condition may have been caused by deficiency of copper in the food. Swayback had not previously occurred in this flock.

—G. B. S. HEATH.

HALLGREN, W., & SANDSTEDT, H. (1947.) **Koboltbehandling vid acetonämi. [Cobalt treatment in acetonæmia.]**—*Svensk Vet-Tidskr.* 52. 89-93. 3077

The authors discuss the aetiology of acetonæmia, which they consider to be only one

symptom of a larger syndrome and a symptom which may not always be prominent. The condition has been found to occur in Sweden mainly on farms where there has previously been an incidence of the condition known as "skravelsjuka" among calves and where cases of inanition among sheep occur and are successfully treated with cobalt. Four cases of acetonaemia, stated to be typical of about a hundred so treated are described. The dosage of cobalt chloride used was about 5 mg. daily, or cobalt sulphate, 5-10 mg. Cobalt was also given prophylactically with success three weeks before calving to a cow that had regularly developed symptoms after calving for four successive years.—F.E.W.

NEZVESKY, L., EATON, H. D., JOHNSON, R. E., MATTERSON, L. D., BLISS, C. I., & SPIELMAN, A. A. (1950.) **The effect of vitamin A from prenatal storage and from ingestion of colostrum on the neonatal calf.**—*J. Dairy Sci.* 33. 315-323. [Authors' summary copied *verbatim*.] 3078

The effect of vitamin A from prenatal storage and from ingestion of colostrum was studied from birth to 28 days of age in 28 dairy calves. One half of these calves were from dams receiving only a basal ration and one half were from dams receiving the same basal ration plus one million U.S.P. units of vitamin A daily for 30 days prior to the calculated date of parturition. At birth the calves from each of the maternal dietary groupings were subdivided into two groups, one receiving colostrum from dams fed only the basal ration and the other receiving colostrum from dams fed the basal ration plus the supplementary vitamin A.

The data indicate that colostrum significantly increased the plasma vitamin A from birth to 5 days of age and liver vitamin A at 28 days of age. Prenatal storage elevated the blood plasma vitamin A level at birth significantly and contributed to greater liver storage of vitamin A at 28 days of age. The other criteria measured, hemoglobin, whole blood and plasma ascorbic acid, liveweight, fecal pH and dry matter and incidence of scours, were not affected significantly by treatment.

HIBBS, J. W., POUNDEN, W. D., & KRAUSS, W. E. (1947.) **Further studies on the effect of vitamin D and of parathyroid extract, "Paroidin", on the blood changes of normal and milk-fever cows at parturition.**—*J. Dairy Sci.* 30. 564-565. [Only abst. given; abst. from abst.] 3079

Daily feeding of ten million units of vitamin D for 5-7 days prior to parturition increased the serum calcium and phosphorus

levels and the expected post-partum decrease was slight when compared with control animals. Parathyroid extract, "paroidin", when injected subcutaneously into non-pregnant cows, also caused a rise in the serum calcium and phosphorus, but it was not satisfactory in preventing milk-fever if the injections started only after the early symptoms had been established.

—E. EDEN.

GRUBER, M. (1950.) **Nature of the vitamin B₁-sparing action of fat.** [Correspondence.] —*Nature, Lond.* 166. 78. 3080

Pigeons were fed diets varying in carbohydrate and fat content. Those animals given the diet in which the carbohydrate to fat ratio was highest had the smallest concentration of aneurin pyrophosphate in their tissues. These results indicate that carbohydrates favour the depletion of the tissue reserves of vitamin B₁, the greatest loss being observed in the liver.—E. EDEN.

DUNNE, H. W., LUECKE, R. W., McMILLEN, W. N., GRAY, M. L., & THORP, F., JR. (1949.) **The pathology of niacin deficiency in swine.**—*Amer. J. vet. Res.* 10. 351-356. 3081

The somewhat contrasting findings of earlier workers, including those from Great Britain, are reviewed, and an illustrated description is given of the lesions encountered in the experimental nicotinic acid deficiency in swine already reported [Luecke, McMillan, & Thorpe, see *V.B.* 19. 559].

Gross internal lesions were for the most part confined to the large intestine. Mesenteric lymph nodes were enlarged and moderately congested. A mild exfoliative dermatitis, located about the ears and on the arch of the back, was present and was characterized by a scaly epidermis, slight thickening of the skin, and roughness of the coat.

In the large intestine, the caecum and as much as 7 ft. of the colon were involved, with masses of faeces, adherent by means of tenacious strands of mucus, varying in size from a few mm. in diameter to complete coverage of the intestinal wall for up to 3 ft. A yellowish exudate in some cases covered portions of the mucous membrane. The wall of the large intestine was usually thickened throughout, slightly doughy in consistency, and tended to tear easily.

From histological studies it is concluded that the lesions in the caecum and colon commence through increased activity of the goblet cells, and with a consequent accelerated flow of mucus. The mechanism of this initial stimulus is not ascertained, but it may conceivably be other than bacterial, since in many

instances bacteria were absent altogether from, or present in small numbers only in, the vicinity of these active glands. There was an absence of neutrophils in such areas, and *Salmonella cholerae-suis* could not be recovered from them. In other areas, primarily about the periphery of a faecal mass where bacteria (enteric group and *Bact. coli*) occurred, goblet cell activity was decreased rather than increased, but there was an infiltration of neutrophils.

As a result of the increased flow of mucus, the lumina of the crypts of Lieberkühn became markedly enlarged. The viscous glandular secretion appeared to have enmeshed faecal debris until a relatively large mass adhered to the mucosa. Areas under the adhered faecal masses showed moderate necrosis. Hyperaemia was an almost constant finding, although varying in degree with the severity and type of lesion involved.

In pigs that had recovered (the age of spontaneous recovery agrees with that of other workers) nodules were present and were found to consist of invaginations of the mucosa into the sub-mucosa, forming cyst-like cavities filled with caseous exudate and surrounded by lymphoid tissues.—ALASTAIR N. WORDEN.

TRAINA, V. (1950.) **Vitamin B₁₂ as an anti-anaphylactic.** [Correspondence.]—*Nature, Lond.* **166.** 78-79. 3082

Intraperitoneal injections of "rubramin", containing vitamin B₁₂, decreased the mortality rate of g. pigs previously sensitized with horse serum.—E. EDEN.

BLAXTER, K. L. (1948.) **Severe experimental hyperthyroidism in the ruminant. I. Metabolic effects. II. Physiological effects.**—*J. agric. Sci.* **38.** 1-19; & 20-27. 3083

I. Metabolism experiments were carried out on five sheep which were fed iodinated casein (4-12 g. per day) and two other sheep which served as controls. When the sheep became hyperthyroid, digestibility of dry matter and crude protein decreased; it is considered that this was due to increased peristalsis of the intestine.

The treated sheep also lost considerable endogenous nitrogen, calcium and phosphorus. Some of these losses occurred through the urine, but the main channel of excretion was through the faeces, probably *via* the digestive juices. In order to determine the source of urinary nitrogen, the different compounds in which this element was excreted were also estimated. From the results obtained, it was concluded that the loss is mainly from muscle, caused by an increased catabolism necessary

to provide the energy for an increased basal metabolic rate.

The calcium losses, however, were probably caused by an increased osteoclastic activity in the bones dependent on the changed endocrinal metabolism of the body. Phosphorus losses were probably caused by both these processes. Serum calcium, phosphorus and magnesium concentrations remained normal.

During the experimental period an increased water consumption was also observed. Most of this excess was lost through the lungs, probably an attempt by the animal to lower the elevated body temperature through panting. Significant weight losses, partly accounted for by loss of subcutaneous fat, also occurred. The loss of fat was not accompanied by ketosis.

II. Pulse and respiratory rates were significantly increased in all treated sheep. Emaciation, cardiac arrhythmia, marked muscular weakness and coughing fits were also observed. Discharge and lachrymation at the nose is considered by B. to be caused by iodine poisoning *per se* and could be controlled by increasing the salt intake; presumably this induced diuresis facilitates the elimination of iodine.

P.M. examination indicated that the main causes of death were cardiac and respiratory failure. This would be expected in ruminants, as they have an inefficient mechanism for heat disposal and excessive panting would affect mainly the heart and lungs.

From the results obtained B. considered that metabolic rate rather than body weight should be used when comparing doses of iodinated casein used for sheep and cattle. A warning is given of the possible danger to the health of lactating cows when feeding high levels of iodinated casein.—E. EDEN.

BORNSTEIN, S. (1948.) **[A nutritional approach to the calf scours problem.]**—*Refuah vet., Palestine.* **5.** 57. English summary, p. 74. 3084

The importance of colostrum in the prevention of calf scours is pointed out. The prophylactic use of vitamins advocated by Phillips *et al.* (1941) is discussed. It is considered that nutritional deficiencies may be partly the cause of calf scours in Palestine.—E. EDEN.

CHAPMAN, D. G., MAW, W. A., & COMMON, R. H. (1950.) **Effects of estrogen and androgen on liver iron of the immature pullet.**—*Sci. agric.* **30.** 194-200. [Authors' summary copied *verbatim*.] 3085

The livers of immature pullets treated with estrogen contained significantly more total iron and inorganic iron per kgm. live weight than the livers of comparable pullets treated with

androgen. The livers of pullets treated with estrogen plus androgen contained significantly more total iron and inorganic iron than the livers of comparable pullets treated with androgen only.

The livers of pullets treated with estrogen only contained significantly more total and inorganic iron per kgm. live weight than the livers of comparable untreated pullets. Neither androgen alone nor estrogen plus androgen gave liver iron contents significantly different from those of the untreated pullets.

It is suggested that the results are most simply explicable on the ground that estrogen increases while androgen decreases storage of iron in the liver of the fowl, and that each hormone will continue to exert its influence on the storage of iron in the presence of the opposing influence of the other.

The copper contents of the livers of pullets treated with androgen or estrogen or both hormones did not differ appreciably from that of untreated pullets.

DISEASES, GENERAL

I. FRANCIS, J. (1948.) **The contributions that quarantine, sanitary measures and eradication can make to preventive medicine.**—*Vet. Rec.* 60. 361-367. 3086

II. BRUFORD, J. W. (1948.) **The contributions that quarantine, sanitary measures and eradication can make to preventive medicine.**—*Ibid.* 378-381. 3087

I. A historical account of some of the chief epizootic diseases occurring in Great Britain is given, stress being laid on the great difficulties encountered by the pioneers in enforcing measures which ultimately led to their eradication. Rinderpest is dealt with at considerable length; also bovine contagious pleuro-pneumonia, TB. and mastitis.

The ravages of rinderpest were directly responsible for the founding of veterinary colleges in Europe towards the end of the 18th century. Most of the early legislation and measures for the control of contagious diseases in animals were aimed against this disease, and its eradication is one of the best examples of the value of sanitary and quarantine measures.

Owing to the lack of sufficiently strict sanitary precautions bovine contagious pleuro-pneumonia was imported into both Australia and America during the 19th century and TB. into the latter country about the same time. Although TB. is less fatal than either rinderpest or bovine contagious pleuro-pneumonia, it was formerly more difficult to diagnose and control because of long duration of the infectivity of the tubercle bacillus outside the body of the host. The tuberculin test has now rendered large-scale eradication possible, even where the incidence of the disease is high.

It is suggested that mastitis, associated with *Streptococcus agalactiae*, is a contagious disease and can therefore be controlled by orthodox measures.

A map photographed from the original cattle-plague (rinderpest) report of 1887 is included; also two graphs, one showing the

incidence of rinderpest in Great Britain from July, 1865, to December, 1866, the other showing the eradication of bovine contagious pleuro-pneumonia.

II. Opening the discussion on Francis's paper [see preceding abstr.] B. pointed out that conditions to-day are different from those originally present when the slaughter policy was first introduced for rinderpest, because re-introduction is now possible by the importation of meat, meat products and artificial manures of animal origin. There are, however, many diseases of a more chronic nature which beset our herds to-day and are difficult to control because they are not easily diagnosed.

B. alluded to calfhood as being the most susceptible age for cattle to contract Johnes's disease, a measure of control being thereby available, and also to the premise that as in his opinion only a small proportion of animals reacting to the tuberculin test disseminate the disease, control becomes easy. He believes that droplet infection in TB. is not as common as many imagine. The view was put forward that calf pneumonia is not an infectious disease, but in most cases is secondary to calf scour and is precipitated by bad housing and husbandry.

In the discussion which followed, reference was made to the fact that vaccination against rinderpest could easily produce an atypical syndrome which might not be recognized as the disease, and so it might be introduced into a country undetected. It was obvious that from recent experience of Newcastle disease there was still a danger of the introduction of epizootics into Great Britain.—D. S. RABAGLIATI.

ANON. (1947.) **Animal disease investigation.**—*Misc. Bull. Indian Coun. agric. Res.* No. 65, pp. 1-31. 3088

This bulletin reviews the work done by the Disease Investigation Officers and Assistant Disease Investigation Officers employed by the Indian Council of Agricultural Research for assisting the Provinces in disease investigation

work and describes a plan of work to be carried out in future. It is divided into three parts: (1) an abstract of the summaries of work of the Disease Investigation Officers from 1932-44, (2) work done by the Assistant Disease Investigation Officers (poultry) from 1934-44, and (3) diseases which require further investigation.

—P. R. K. IYER.

SANDSTEDT, H. (1950.) Orienterande undersökningar över polymyosit hos häst. [**Poly-myositis in horses.**]—*Nord. Vet.-Med.* 2. 424-430. [English and German summaries. Abst. from English summary.] 3089

It is suggested that phytin may be related to this polymyositis. Inositol, given subcutaneously and intravenously, yielded good results.

ANON. (1950.) **Oedema disease of swine.**—*Vet. Rec.* 62. 135-136. 3090

The onset of this disease, at 10-14 weeks, may be very sudden and its course dramatic; the animals often die in 4-5 hours and mortality may be over 90%. On P.M. examination oedema of the bowel and other tissues can be observed, but atypical cases are not infrequent.—E. EDEN.

BULLIS, K. L., SNOEYENBOS, G. H., & VAN ROEKEL, H. (1950.) **A keratoconjunctivitis in chickens.**—*Poult. Sci.* 29. 386-389. [Authors' summary copied *verbatim*.] 3091

A keratoconjunctivitis in young chickens has been called to the attention of the laboratory with increasing frequency in recent years. Although the mortality is low, the economic loss is high in affected units because of rapid loss of weight and retarded growth in affected birds. Factors associated with the environment appear to be responsible for the disturbance. Changes in poultry rearing practices which have permitted an increase in the liberation of ammonia from the litter appear to be contributory. The maintenance of suitable environ-

mental conditions with particular reference to management of the litter appears necessary to prevent this disturbance.

COLE, R. K. (1950.) **Differences in familial incidence of mortality from "blue comb" disease.**—*Poult. Sci.* 29. 398-404. [Author's summary copied *verbatim*.] 3092

A study of the effects of a natural outbreak of blue comb disease upon more than 2,800 immature White Leghorn pullets has revealed significant strain differences in the resulting mortality. The mortality within the three strains considered was 0, 1.0, and 7.4 per cent. An intermediate mortality of 3.3 per cent. was found among crosses between the strain with the highest mortality rate (7.4 per cent.) and that with the relatively low mortality rate of 1.0 per cent. This suggests multiple factor inheritance.

Significant differences between sire families within the most susceptible strain, and between dam families within sires, were also found. A very close relationship of the three sires which produced the most susceptible families (35 to 46 per cent.) further emphasizes the genetic nature of susceptibility to this disease.

Within the limits of 9 to 17 weeks, no relationship was found between age and mortality from blue comb disease. In all three strains the cockerels were not susceptible.

HADDY, F. J., CAMPBELL, G. S., & VISSCHER, M. B. (1949.) **Effects of changes in body temperature and inspired air humidity on lung edema and hemorrhage.**—*Amer. J. Physiol.* 158. 429-432. [Authors' abst. copied *verbatim*.] 3093

Under the conditions studied, hyperthermia favoured the production of pulmonary oedema, haemorrhage and congestion in guinea pigs. The humidity of the inspired air was a factor of no great consequence in the production of pulmonary lesions in these studies.

POISONS AND POISONING

JENSEN, R., TOBISKA, J. W., & WARD, J. C. (1948.) **Sodium fluoroacetate (compound 1080) poisoning in sheep.**—*Amer. J. vet. Res.* 9. 370-372. 3094

The use of "1080" as a rodent poison presents danger principally to animals grazing at range. There is no chemical method of identifying the poison after ingestion and in consequence claims for losses of livestock after rodent campaigns are difficult to interpret. An attempt was made to find the lethal dose for sheep; the palatability of the field bait and the

symptoms and P.M. findings in poisoned sheep are described.

A field bait containing 1 mg. 1080 per g. was offered to sheep fasted for 24 hours and found to be unpalatable, but the small quantities which were eaten contained sufficient poison to cause 25% of deaths. Six pairs of sheep which did not eat voluntarily were fed, by stomach tube, amounts of 1080 corresponding to 0.25, 0.5, 0.75, 1.0, 2.5 and 10.0 mg. per kg. All except the pair receiving 0.25 mg. per kg. developed symptoms and died within 3-17 hours.

Symptoms were not diagnostic, and began with intermittent convulsions of groups of muscles. Periods of frenzy alternated with weakness and lethargy, the animal adopting a rump-sitting position. Four hours after dosing the heart rate averaged twice that of three controls.

No specific changes were found P.M. The authors concluded that 1080 presents a real danger to sheep.—R. J. FITZPATRICK.

MITROVIC, M. (1948.) Due casi di avvelenamento ad esito letale in cavalli trattati con dosi terapeutiche di fecondità [fenotiazina]. [Fatal poisoning in horses dosed with phenothiazine].—*Zootec. Vet., Milan*, 3, 157-160. [English summary.] 3095

Twelve strongyle infested horses two and a half years old were given *per os* doses of 15-30 g. of phenothiazine. After 12 days five of eight horses dosed with 15 g. and three of four dosed with 30 g. became ill with yellow staining of the visible mucosae, weakness of the hind legs and staggering, anorexia, dyspnoea and haemoglobinuria. One horse of the group which had been given 15 g. and one of the group dosed with 30 g. died within 24 hours. The remainder were given purgatives and caffeine injections and recovered within a week.

P.M., lesions were found in the liver, kidneys and myocardium. The spleen was enlarged, there was pulmonary oedema and there was yellow staining of the subcutaneous tissue.—E.G.

RADELEFF, R. D. (1949.) **Toxaphene poisoning: symptomatology and pathology.**—*Vet. Med.* 44, 436-442. 3096

Poisoning from any of the chlorinated hydrocarbon insecticides cannot be easily diagnosed as the origin of the organic chlorides, determined by analysis of the body tissues, is not indicated. It is especially important to note the symptoms and pathology of known cases of such poisoning.

R. described the histories of animals which had been dosed or sprayed with toxaphene, a chlorinated terpene, and found that many symptoms were similar to those of chlordane poisoning.

Within the dose range of 50-250 mg. per kg. given *per os*, or 4-8% emulsion given as a spray, the severity of symptoms produced did not increase with an increase in the dose of toxaphene.

The central nervous system was largely affected. Convulsions always occurred and it was therefore not unusual to find haemorrhage and congestion in many of the organs on P.M. examination. In addition there were two separate behaviour syndromes. Some animals appeared blinded and stunned and P.M. there was little nerve damage, only a considerable increase in the cerebrospinal fluid. In others there was great excitability which was related to degeneration of neurones and often "blue staining areas" of the grey matter were found P.M. R. considers that the "blue staining areas" are comparable to the condition of mucoid degeneration of the oligodendroglia with the formation of free mucin.

—MARGARET J. LETHBRIDGE.

STEYN, D. G. (1950.) **Poisoning with the seeds of *Argemone mexicana* (Mexican poppy) in human beings. Indian epidemic dropsy in South Africa.**—*S. Afr. med. J.* 24, 333-339. 3097

An outbreak of "human epidemic dropsy" was caused by poisoning with argemone oil. The literature is discussed on cases of such poisoning and on the possible chemical properties of the active principles involved.

Feeding of fresh argemone plants to sheep failed to produce toxic symptoms but when argemone seeds were mixed into the diet of White Leghorn cocks signs of poisoning similar to those in human beings were observed. S. considers that the primary damage affects the capillary walls and the liver and that the other signs are of a secondary nature.—E. EDEN

COWARD, T. G. (1949.) **Acute, fatal poisoning in sheep due to ingestion of common sorrel (*Rumex acetosa*).**—*Vet. Rec.* 61, 765-766. 3098

A flock of sheep was moved on to a pasture containing a large proportion of sorrel in seed. By the next day 12 sheep were ill with ataxia and prostration, and five of them died; the others gradually recovered. The oxalic acid content of the rumen was found to be 200 p.p.m.

As the animals had been kept on poor pasture before, they consumed an unusually large amount of sorrel. It is also likely that their diet was deficient in calcium; this would enhance the toxicity of the oxalic acid ingested.

—E. EDEN.

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections, see under the appropriate disease)

LOUW, P. G. J. (1949.) **The cardiac glycoside from *Urginea rubella* Baker. Part I.**

Isolation and properties of rubellin.—*Onderstepoort J. vet. Sci.* 22, 313-319. 3099

The active principle of *Urginea rubella* Baker was isolated in a crystalline form and named rubellin. This compound, a cardiac glycoside, has an empirical formula of $C_{36}H_{48}O_{16}$. Its physical and chemical properties are reported. The amounts of rubellin required to produce toxic symptoms in rats and rabbits are also given.—E. EDEN.

RUDEANU, A., & BOTEZ, M. (1950.) **Muscular contraction induced by acetylcholine and aeration.** [Correspondence.]—*Nature, Lond.* 165. 608-609. 3100

A description is given of the effect of air on the contraction induced by acetylcholine of the dorsal muscle of the leech and of the rectus abdominalis of *Rana esculenta* and the presence or absence of physostigmine. From the results obtained it is concluded that air is essential for the production by acetylcholine of normal muscular contraction, and that acetylcholine is only destroyed in the muscles by cholinesterase in the presence of air.—E. EDEN.

FOLEY, E. J., & BYRNE, J. V. (1949.) **Observations on the treatment of *Streptococcus agalactiae* and *Staphylococcus aureus* udder infections with mixtures of streptomycin and penicillin.**—*Cornell Vet.* 39. 243-248. 3101

Quarter-samples from a herd of 45 dairy cows were examined culturally for streptococci or staphylococci. Infected quarters were treated with 20 ml. of an emulsion containing 100,000 units of sodium penicillin and 1 g. of the calcium chloride complex of streptomycin. Follow up samples were taken for culturing and for leucocyte counts at intervals of 5, 10, 20 and 30 days.

21 out of 24 quarters infected solely with *Streptococcus agalactiae*; 12 of 14 quarters with *Staphylococcus aureus*; and both of 2 quarters with *Str. dysgalactiae* were freed of infection. Of 5 quarters with mixed infections of *Str. agalactiae* and *Staph. aureus* three were completely freed and two were freed of one organism. All of 7 quarters with persisting infections were given a second treatment and all responded successfully.

The persistence of streptomycin and penicillin in udders was investigated using filter paper disc methods. Streptomycin alone persisted 12-24 hours when given in water and 36-60 hours in the emulsion described. The mixture of antibiotics in the emulsion gave persistence of streptomycin for 48 hours and of penicillin for 60-72 hours.

The authors consider that such combinations are superior to penicillin with *Staph. aureus*

infections and not inferior to penicillin against *Str. agalactiae*.—R. J. FITZPATRICK.

RUSSO, H. F., GASS, S. R., MILLER, A. K., & McCONVILLE, C. (1950.) **Gastro-intestinal absorption of aqueous penicillin by dogs.**—*N. Amer. Vet.* 31. 28-29. 3102

Blood and urine levels of penicillin were estimated during the first four hours after administration to dogs. After a dose of 100,000 units it could be detected during this period in the blood and on an average 10% of the dose was recovered from the urine. The authors suggest that dosage *per os* is satisfactory.—E. EDEN.

HEZLET, R. K. (1948.) **Diagrams for the estimation of sulphonamide dosage.**—*Vet. Rec.* 60. 107-108. 3103

This is a series of three nomograms, for small, large, and both large and small animal weights, relating body weight, dose and dosage factor (0.1—0.2 g. per kg.) whereby the dose in g. or oz. may be read off directly.

—MALCOLM WOODBINE.

SWANSON, E. W., & HERMAN, H. A. (1947.) **The effect of intramammary treatment for mastitis upon milk secretion.**—*J. Dairy Sci.* 30. 562. [Only abst. given; abst. from abst.] 3104

Injectations of aqueous solutions of penicillin into the udder of cows did not decrease milk production. On the other hand sulphanilamide dissolved in iodized mineral oil and injected daily for four days adversely affected the milk yield, normal production being attained seven days after treatment had stopped.—E. EDEN.

I. FREYBERG, R. H. (1950.) **Effects of cortisone and ACTH in rheumatoid arthritis.**—*Bull. N.Y. Acad. Med.* 26. 206-211. 3105

II. BAEHR, G., & SOFFER, L. J. (1950.) **Treatment of disseminated lupus erythematosus with cortisone and adrenocorticotropin.**—*Ibid.* 229-234. 3106

III. PEARSON, O. H., ELIEL, L. P., & TALBOT, T. R., JR. (1950.) **The use of ACTH and cortisone in neoplastic disease.**—*Ibid.* 235-239. 3107

IV. RUSSELL, J. A. (1950.) **Physiology of the pituitary-adrenal system.**—*Ibid.* 240-250. 3108

V. RAGAN, C., HOWES, E. L., PLOTZ, C. M., MEYER, K., BLUNT, J. W., & LATTES, R. (1950.) **The effect of ACTH and cortisone on connective tissue.**—*Ibid.* 251-254. 3109

VI. FISCHER, E. E. (1950.) **The relationship of adrenal cortical activity to immune responses.**—*Ibid.* 255-260. 3110

This series of papers read at a special meeting of the New York Academy of Medicine in January, 1950, indicates the present status of cortisone and ACTH (adrenocorticotrophin) from the viewpoint of the medical clinician.

I. The data presented in the first paper indicate that rheumatoid arthritis in its various manifestations is quickly and greatly improved when cortisone or ACTH is administered. Reduction of non-articular stiffness is followed by marked lessening of pain at the joints and in non-articular connective tissue; next comes progressive decrease in joint inflammation and lastly abatement of articular tenderness. These changes occur within a period ranging from a few days to a fortnight depending on the duration and severity of the disease. Good responses have also been seen in rheumatoid spondylitis and in psoriasis and arthritis. Problems relating to dosage schedules and to toxic side effects resulting from undesirable metabolic or hormone stimulation are discussed.

II. Based on the treatment of nine patients with various forms of collagen disease—five were typical examples of disseminated lupus erythematosus. This latter disease occurs predominantly in females and often enters a remission during gestation. Cortisone and ACTH are life-saving as therapeutic agents but their use is accompanied by serious hazards due to rapid shifts of blood electrolytes between cells and intercellular spaces and to increases in total body water sufficient to induce congestive heart failure and pulmonary oedema.

III. Pearson *et al.* report studies indicating that remissions can be induced in acute leucaemic conditions of both children and adults by the administration of ACTH but issue a warning that, at present, these remissions must be considered to be both incomplete and temporary.

IV. This deals with adrenocortical physiology and starts by stating bluntly that what is known of the actions of adrenal hormones does little to explain the dramatic effects seen in the treatment of rheumatic and allergic states with cortisone and ACTH. The actions of the known active adrenal corticoids are discussed under the following headings:—(a) water and salt balance and related processes, (b) organic metabolism—carbohydrate, protein, and fat, (c) lymphoid and other mesenchymal tissue and (d) resistance to changes in environment or stress of various types. It is interesting to note

that 17-hydroxy corticosterone (compound F) may be the principal steroid secreted by the adrenal cortex itself and that it appears to be twice as active as cortisone (compound E).

V. Ragan *et al.* give a brief description of small-scale experiments in rabbits indicating that cortisone and ACTH administration lead to a suppression or decrease in the reactivity of connective tissue in response to trauma.

VI. Fischel's paper concludes the symposium by a very short discussion of certain aspects of the relationship of ACTH and cortisone to immune processes. He concludes by indicating that, while these hormones appear to have a definite effect on immune mechanisms, there is no conclusive evidence to indicate whether this effect occurs at the level of antibody production, at the level of union of antigen and antibody, or at any other point in the development of the immune response.

[The interest to veterinary medicine is in the possible applications of these findings to such problems as treatment of grass sickness, hypomagnesaemia and other metabolic diseases, arthritic conditions in horses, etc.]

—J. LOCHIEL MCGIRR.

LONGLEY, E. O. (1950.) **Intravenous ether for general anaesthesia in the horse.**—*Vet. Rec.* **62.** 30-32. 3111

Ether (75-100 ml.) dissolved in two l. of saline at 30°C., given by means of an intravenous drip, was a satisfactory prolonged anaesthetic for horses of approximately 520 kg. in weight if they were at first anaesthetized with thiopentone. The corneal reflex and the type of respiration were used as a basis for the assessment of the depth of anaesthesia. There was no excitement or struggling in the course of the anaesthesia.—E. Eden.

GAHAN, J. B., & WEIR, J. M. (1950.) **Houseflies resistant to benzene hexachloride.**—*Science* **3.** 651-657. 3112

In Egypt, in a campaign against houseflies, monthly application of benzene hexachloride as dusting powder was satisfactory for the first ten months. Later the intervals between dusting were gradually shortened until applications were being made weekly, otherwise an adequate control could no longer be maintained. Laboratory experiments with these local flies and other strains supported the hypothesis that they acquired partial resistance to benzene hexachloride.—E. EDEN.

See also absts. 3006 (blackhead); 3007 (hormone therapy); 3095 (phenothiazine, toxicity to horses); 3096 (toxaphene toxicity); 3186 (German pharmacopoeia).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

RONCATI, G. (1948.) L'ipofisi gravidica nelle bovine. [The pituitary gland of pregnant

cattle.]—*Ann. Fac. Med. Vet., Pisa.* **1.** 164-170. [English and French summaries.] 3113

After a brief review of previous descriptions of the cytology of the bovine pituitary gland, R. discusses his observations on the pituitaries of five cows—one, two, three and five months pregnant. In all cases there was a marked preponderance of eosinophiles, particularly in the lateral regions. Near the margin in the vicinity of the neurohypophysis there were numerous cells with large nuclei and scanty cytoplasm—the “fundamental” cells. Some of these had eosinophile granules in the cytoplasm—particularly in the case of the animal five months pregnant, and may represent an intermediate phase in the transition of such cells into eosinophiles.—A. T. COWIE.

FINDLAY, J. D., GOODALL, A. M., & YANG, S. H. (1950.) **The number of sweat glands in the helix of the cow's ear and the milk yield.**—*J. Dairy Res.* 17. 22-36. [Authors' summary copied *verbatim*.] 3114

A study has been made of the distribution of the so-called sweat glands in the ears of Ayrshire cattle. The number of sweat glands per unit area of skin in the ear was found to vary greatly from one part of the ear to another and did not appear to be related to the milk yield. It is concluded that it is impossible to use the sweat-gland count in the ear as an indication of the milk-producing capacity of Ayrshire cattle. The number of sweat glands per unit area in the ear of the very young calf was found to be greater than in the fully grown cow, the number being roughly inversely proportional to the surface area of the ear. These findings for Ayrshire cattle are contrary to those published by a number of other workers for cattle of the Red German breed, who claim that any portion of the ear can be used to obtain a sweat-gland count which is closely correlated with milk yield.

KING, J. O. L. (1949.) **Variation in the body temperature of dairy cows, and its influence on milk composition.**—*Indian vet. J.* 26. 55-61. 3115

In observations on Ayrshire and Friesian cows, rise of body temperature developed at high atmospheric temperature, after exercise, and at oestrus. In such circumstances the composition of the milk changed. There was an increase in the fat and a decrease in the solids-not-fat percentage.—K. C. SINHA.

RODBARD, S. (1950.) **Weight and body temperature.**—*Science.* 111. 465-466. 3116

The body temperatures of mammals and birds were plotted against the logarithms of their body weights. It was found that the larger the bird the lower the body temperature.

This relationship was also observed with mammals weighing approximately one kg. or more. Smaller mammals, on the other hand, showed a decrease in body temperature with a decrease in their weights. Body temperature was not dependent on species affinity. The various factors which may affect body temperature are discussed.—E. EDEN.

TRIBE, D. E. (1949.) **The importance of the sense of smell to the grazing sheep.**—*J. agric. Sci.* 39. 309-312. [Author's summary copied *verbatim*.] 3117

A series of experiments was carried out to assess the importance of the sense of smell to the grazing sheep. The results of the first two experiments described indicated that the sense of smell is of importance in the initial stimulation of appetite, but under the experimental conditions the selection of particular herbage species was not affected. Further experimentation showed that, because of its adaptation character, olfaction can only be of supplementary importance in influencing the food selection of the grazing sheep.

TRIBE, D. E., & GORDON, J. G. (1949.) **The importance of colour vision to the grazing sheep.**—*J. agric. Sci.* 39. 313-314. [Authors' summary copied *verbatim*.] 3118

Since sheep failed to associate either a red or blue colour with the palatability of their food during the course of an experiment designed to test for colour vision, it was concluded that sheep are colour blind.

NICKERSON, M., BERGHOUT, J., & HAMMERSTROM, R. N. (1950.) **Mechanism of the acute lethal effect of epinephrine in rats.**—*Amer. J. Physiol.* 160. 479-484. [Authors' summary copied *verbatim*.] 3119

Experiments designed to protect rats against lethal doses of epinephrine administered intraperitoneally have demonstrated the following points: (1) The lethal effect of epinephrine is not due to the accumulation of epinephrine or 'epinephrine-like' chromogens in the myocardium. (2) The animals may be protected against the lethal effect of epinephrine by either artificial respiration or systemic arterial pressure stabilization. (3) Pulmonary edema is not involved in the respiratory failure resulting from the administration of large doses of epinephrine.

It is concluded that the lethal effect of epinephrine in rats is dependent upon the induced rise in arterial pressure which in some way brings about respiratory arrest. This lethal effect appears to be unrelated to the transient 'epinephrine apnea' which is not

dependent upon a rise in arterial pressure. On the basis of these observations it must be concluded that the protection afforded against the lethal effect of epinephrine in rats, and presumably also in mice, by various drugs is not a measure of their specific adrenergic blocking activity.

LUCAS, A. M. (1950.) **Lymphoid tissue and its relation to so-called normal lymphoid foci and to lymphomatosis. V. A study of lymphoid areas in the pancreas of pheasants and wild Mallard ducks.**—*Poult. Sci.* 29. 450-461. [Author's summary copied *verbatim*.] 3120

The amount of lymphoid tissue (based on number of areas) was determined for pancreas sections from Mallard ducks and from pheasants. The data obtained were compared with those from domestic White Pekin ducks and laboratory chickens resistant to lymphomatosis.

The ranking of the various groups of birds based on the mean values and variance analyses indicated that the White Pekin ducks and pheasants had the least amount of lymphoid tissue, Mallard ducks ranked next and laboratory resistant chickens had the most of the four groups compared.

These results are in agreement with previous observations that the amount of ectopic lymphoid tissue is approximately proportional to the predisposition toward lymphomatosis.

The ectopic lymphoid areas, whether large or small, invade and destroy adjacent acinar tissue and cannot be considered as normal structures.

The various possible relationships between the agent of lymphomatosis and ectopic lymphoid areas are discussed.

FELDBERG, W. (1950.) **The role of acetylcholine in the central nervous system.**—*Brit. med. Bull.* 6. 312-321. 3121

The effect and the possible mode of action of acetylcholine, eserine and other anticholinesterases on the central nervous system was discussed. The synthesis of acetylcholine, its release at synapses and subsequent changes were also described. It was concluded that acetylcholine may act as a chemical transmitter not only at neuromuscular end plates and sympathetic ganglia, but also at some of the synapses in the central nervous system: in this tissue probably cholinergic alternate with non-cholinergic neurones.—E. EDEN.

FERGUSON, K. A. (1949.) **The effect of sympathectomy on wool growth.**—*Aust. J. sci. Res. Ser. B.* 2. 438-443. [Author's summary copied *verbatim*.] 3122

Five sheep (two Merinos, two Corriedales, and one crossbred) were subjected to unilateral thoracic sympathectomy. Fleece samples were collected at 28-day intervals for a period of seven months, from tattooed areas of skin on both the sympathectomized and control sides.

The results show a mean increase of 36 per cent. in wool growth rate on the sympathectomized side over the control side for ten weeks after the operation. This effect then disappeared so that no difference between the two sides was observed over the remainder of the experimental period. It is suggested that the initial effect of sympathectomy on wool growth rate was brought about by vasodilation of the denervated vessels and that the subsequent disappearance of this effect was due to the onset of warmer weather causing vasodilation of the control side.

Skin surface temperature showed a significant increase on the sympathectomized side immediately after the operation but this effect also disappeared within a few weeks so that no difference was detected during the fleece collection periods. Skin surface temperature may have been depressed on the sympathectomized side during the process of actual measurement due to constriction of the denervated cutaneous vessels caused by nervous excitement.

OAKBERG, E. F. (1950.) **Distribution and amount of lymphoid tissue in some of the splanchnic nerves of chickens in relation to age, sex, and individual constitution.**—*Poult. Sci.* 29. 420-436. [Author's summary copied *verbatim*.] 3123

Lymphoid tissue in visceral nerves was studied for a total of 56 birds, 28 males and 28 females, evenly distributed among age groups of 1, 10, 20, 40, 100, 200, and 300 days. Number of lymphoid areas, size of lymphoid areas, and percentage of lymphoid tissue were greater for the 40, 100, and 300 day groups than at 0, 10, 20, and 200 days. Individuals of the same age and sex were found to differ greatly in number, size, and total amount of lymphoid tissue. No correlation in development of lymphoid tissues was observed between pancreas and visceral nerves. Pathology of lymphoid foci in nerves was such as to indicate destruction of tissue and possibly disruption of organ function by lymphoid involvements not grossly visible.

The presence and histological appearance of lymphoid tissues in splanchnic nerves has been discussed in relation to normality and abnormality. It is suggested that all extravascular lymphoid areas in nerves of chickens be considered abnormal, and as a possible

indication of the presence of the causative agents of lymphomatosis. This conclusion should be considered as a working hypothesis subject to further evaluation and refinement.

BLOSSER, T. H., & SMITH, V. R. (1950.) **Parturient paresis. VI. Some changes in the urinary excretion of certain constituents at parturition and their possible association with changes in the blood picture.**—*J. Dairy Sci.* 33. 329-337. [Authors' summary copied *verbatim*.] 3124

Urinary calcium excretion by eight Jersey cows was quite variable at parturition. There was no consistent or appreciable variation between the normal, milk-fever and borderline cows. Neither did a relation exist between calcium losses via urinary channels and changes in the blood calcium. Urinary magnesium losses were much more extensive between days 16 and 3 prepartum in the cows which developed milk fever than in the normal cows. The borderline cows were intermediate between the other groups in this respect. All three groups were excreting essentially the same amounts of magnesium via the urinary route on the day of parturition. Following parturition, the magnesium excretion by the normal group increased, and by days 5 and 10 postpartum, the normal cows were excreting more urinary magnesium than either the milk-fever or borderline groups. In general, blood serum magnesium seemed to rise in the milk-fever and borderline cows as the urinary excretion of this constituent decreased, but this relation was not consistent throughout the trial. There was approximately five times as much citric acid excreted in the urine of the cows which subsequently developed milk fever on days 3, 2 and 1 prepartum, as was excreted in the urine of the normal or borderline cows on those days. The high levels of citric acid excretion were accompanied by levels of blood serum citric acid in the milk-fever cows which were higher than normal. Very small and consistent amounts of inorganic phosphorus were excreted by all of the cows prepartum, with no group

differences. In general, the postpartal excretion also was very small. There was no apparent relation between blood plasma levels of inorganic phosphorus and the urinary excretion of this constituent.

MEYER, K. (1947.) **The biological significance of hyaluronic acid and hyaluronidase.**—*Physiol. Rev.* 27. 335-359. 3125

The occurrence of hyaluronic acid, its physical and chemical properties are discussed. Its chemical structure as yet has not been completely elucidated, but hyaluronic acid is a mucopolysaccharide containing hexosamine and uronic acid units. Even less is known of hyaluronidase which may contain several enzyme components, hence it is not surprising that hyaluronidases isolated from various sources differ in their chemical and biological actions. A critical discussion of the various biological and chemical methods for hyaluronidase determination is presented. The possible mechanism of hyaluronidase action and the role of interfering substances are also discussed. A special section is devoted to bacterial hyaluronidases and their relation to capsule formation. Another section deals with the possible role of hyaluronic acid in collagen formation and its function in ocular and synovial fluids. The clinical application of hyaluronidase is also discussed.—E. EDEN.

FOLLIS, R. H., JR., & BERTHRONG, M. (1949.) **Histochemical studies on cartilage and bone. I. The normal pattern.**—*Johns Hopk. Hosp. Bull.* 85. 281-297. 3126

The authors discuss the literature and record observations on P.M. examinations of the cartilage and bone of normal rats, g. pigs, and human beings. Qualitative techniques were used to identify and locate cytochrome oxidase, succinic acid dehydrogenase, citric acid dehydrogenase, phosphatase, glycogen, mucopolysaccharides, desoxyribose nucleic acid, ribose nucleic acid and neutral fat. The hydrogen-ion concentration of fresh slices of cartilage and bone was also determined.

—L. M. MARKSON.

See also absts. 2978-9 (proteolytic enzymes).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

MOORE, R., & MULLANEY. (1949.) **Salmonella dublin infection in cows and cow's milk.**—*Irish vet. J.* 3. 384-388. 3127

Fifty persons were affected in an outbreak of food poisoning traced to milk infected with *S. dublin*. In the dairy affected it was the practice to bulk and bottle the milk from five

cows at a time; this restricted the extent to which the milk from the dairy was infected. On the morning of the outbreak, one of the cows had severe diarrhoea and a decrease in milk yield, and died the following day. The spring from which the water supply originated was free from infection, but the stream leading to

the water tank was contaminated by the faeces of the cows in the herd and *S. dublin* was isolated from the drinking water.

One cow was found to be secreting *S. dublin* in both the milk and faeces. The animal appeared to be healthy; it was sold.

M. stated that this was the first case reported in Ireland, in which infection was undoubtedly of bovine origin.—J. O. L. KING.

SCHÖNBERG, F. (1949.) Zu den besonderen Aufgaben der Tierärzte im Rahmen der Schlachtier- und Fleischuntersuchung, der Lebensmittel- einschl. Fisch- und Milchüberwachung. [The task of veterinarians in meat, food, fish and milk hygiene.]—*Dtsch. tierärztl. Wschr.* 56. 117-120. 3128

S. recapitulates a number of known items of German food hygiene legislation in the light of the inevitable relaxation of controls which took place during the late war, and of the increased need for surveillance during the post-war period of shortages.

He discusses the inspection of slaughter animals and of meat, particularly with regard to meat conditionally released for human consumption and to the problems arising from its use for the manufacture of salami and similar meat preserves.

S. deplores the decline of a previously high standard of inspection and treatment of milk and pleads for as speedy as possible a return to special high grade raw milk from adequately tested and supervised herds; he discusses pasteurization of milk in the light of the prevailing facilities in Germany.

—G. P. MARSHALL.

SGAMBATI, A. (1948.) La tutela dell'uomo dalla infestazione da *Trichina*. [The danger to man of *Trichinella* infection.]—*Zooprofilassi.* 3, No. 10. pp. 11-22. 3129

A general review of the literature on the subject, containing no new information. Measures to reduce the danger of human infection are discussed.—E.G.

KRANEVELD, F. C. (1946.) Diergeneeskundig ondersoek in Indonesië gedurende de laatste 25 jaar. [Veterinary research in Indonesia during the last 25 years.]—*Tijdschr. Diergeneesk.* 71. 953-966. 3130

K. reviews the activities and achievement of the various research workers at the Veterinary Institute at Buitenzorg in Java. He refers to their publications dealing with various veterinary problems such as: the testing of cattle for TB.; the control of contagious abortion by vaccination; lepra (tuberosa) bubalorum caused by an acid-fast organism which could not be

cultured or established in laboratory animals or even in young buffaloes; the haematology of glanders; the recovery of *Brucella abortus* from nodules caused by *Onchocerca gibsoni* and from the peri-articular connective tissue in *Onchocerca bovis* cases and from the fluid in cases of hygroma; *Br. abortus* as the cause of "sakit sané", a condition referred to in this report as comparable to hygroma; the presence of *Br. suis* infection; the introduction of a satisfactory vaccine for haemorrhagic septicaemia in cattle; the presence of histamine in haemorrhagic septicaemia vaccine as a cause of mortality in buffaloes; the immunity mechanism in pasteurellosis; apopleptic deaths proved to have resulted from a paralysis of the respiratory centre following the use of anthrax vaccine; the preparation of a reliable anthrax vaccine from a strain imported from Onderstepoort; the spread of anthrax by tabanids; the destruction of extracellular anthrax bacilli by a ferment produced by leucocytes; the finding that formolized cultures proved to be antibacterial and the use of filtrates of phenolized cultures as an anti-aggressin vaccine in blackleg.

Other problems which received attention were: osteomyelitis bacillosa bubalorum, surra, anaplasmosis, piroplasmosis, rabies, foot and mouth disease, cysticercosis in cattle and pigs, trichinosis in pigs, stephanofilariasis (dermatitis verminosa pruriens bovis), distomatosis of the pancreas, treatment of helminth infestation with phenothiazine, hyphomycosis destruens, influenza in dogs and cats, influenza equorum, stomatitis contagiosa in sheep, chorioptes caprae, salmonellosis in buffaloes, pigeons, turkeys and fowls, amoebic dysentery in dogs, colpitis granulosa, plant poisoning, Bali disease in cattle [in some aspects—muco-purulent conjunctivitis, affections of nasal and buccal mucosa, slight icterus and mummification of the skin—this condition resembles nodular skin disease of cattle in S. Africa] and sakit ingoesan (a form of malignant catarrh).

Tuberculosis, coryza infectiosa, salmonellosis, spirochaetosis, coccidiosis, blackhead, and lymphatic and myeloid leucaemia in poultry were investigated. Animal genetics, animal management and the feeding value of indigenous crops received attention. The results of some of the investigations had not yet been published.

—P. L. LE ROUX.

PURSELL, R. T. (1949.) The personal and legal risks of veterinary practice.—*Aust. vet. J.* 25. 180-185. 3131

P. discusses risks to veterinarians from direct injury by refractory animals, indirect injury through transmissible diseases and

cumulative effects of X-ray damage, occupational disease, including conditions such as duodenal ulcer and nervous disorders resulting from strain and anxiety and the legal risks arising from charges of negligence, injuries caused by animals left in the veterinarian's care, losses of stock through faulty vaccines and other thera-

peutic agents used in good faith by the practitioner, actions for causing a nuisance and breaches of contract between practitioners and assistants. Such means as there are for safeguarding against such contingencies are discussed in the light of much experience in small animal practice in Sydney.—D. A. GILL.

LIVESTOCK HYGIENE

DAVIDSON, F. A. (1949.) **Farm buildings in relation to the health of dairy cows and milk production.**—*J. R. sanit. Inst.* 69. 372-382. 3132

The bail system is a sound commercial proposition under suitable conditions providing there is reliable sterilization and adequate milk cooling. In the yard system the yards must be arranged so that each leads directly to the collecting pen at the parlour entrance. Covered yards often have insufficient light and ventilation, and dehorning does not eliminate all bullying. Shortage of straw leads to unsatisfactory conditions, but, with unlimited supplies, large quantities of manure are produced.

In the construction of cowsheds, the best inlet is an iron louver with the vanes turned up, and the best outlet for a double shed is either an open ridge or a ridge louver. The most important point affecting the cleanliness of the cow is the overall length of the stall, and for the average Ayrshire this should be 7 ft. 3 in. with a trough width of 1 ft. 11 in. No channel

should be less than 3 ft. wide, so that the urine can run away freely. With channels this width there is no need for a wide gangway in the centre of a double shed, and in a narrow single shed a gangway can be dispensed with and the channel taken back to the wall. All lighting in double sheds should be in the bottom third of the roof or high in the wall, with artificial lighting arranged similarly. Feeding passages are of very little use. The water supply must be ample, 30 to 40 gal. per cow per day being required, and 10 gal. per day for heifers.

No drainage traps are to be allowed inside cowsheds, but manure pits may be built near the cowshed if they are below the level of the other buildings and have good retaining walls. In the average dairy two rooms are sufficient, one for storing milk and utensils and the other for sterilizing equipment.

In supervising clean milk production, three or four milk samples should be collected at various points in production, and examined for bacterial count and *Bact. coli*.—J. O. L. KING.

See also absts. 3087 (sanitary measures); 3117-8 (grazing sheep); 3189 (housing).

REPRODUCTION AND REPRODUCTIVE DISORDERS

STEWART, D. L. (1950.) **Artificial insemination of cattle. A review of the work of the Reading Cattle Breeding Centre, October 1st, 1944, to September 30th, 1948.**—*Vet. Rec.* 62. 389-395. [Author's summary copied *verbatim*.] 3133

The rapid increase in the number of cows inseminated per year indicates that artificial insemination is a satisfactory method of breeding cattle. Although the conception rates obtained are satisfactory when compared with natural mating, there is need for much investigation in this field owing to the apparently inexplicable reductions in fertility that do occur. There is no apparent breed difference among the bulls used at the Reading centre so far as fertility is concerned. The interchange of semen between artificial insemination centres is a practical procedure, as judged by the conception rates thus obtained. An attempt has been made to show the relationship between

the estimated conception rate and actual pregnancies.

KRIISA, A. (1948.) Über Besamung nach Abdrücken des Follikels und nach dem Follikelsprung beim Rinde. [Insemination after extrusion of the ova from the follicles and after spontaneous follicular rupture.]—*Dtsch. tierärztl. Wschr.* 55. 22-25. 3134

In the cow insemination followed by rupture of the follicle by rectal palpation during oestrus did not result in pregnancy, but insemination was successful after artificial or spontaneous rupture of a fully ripe follicle.

—A. T. COWIE.

KUCEL, J. (1950.) Važnost umjetnog osjemenjivanja goveda sa stanovišta veterinarske službe. [Artificial insemination in the control of disease in cattle.]—*Vet. Glasnik.* 4. No. 1. pp. 1-14. [German summary.] 3135

About 38% of cows which were brought to the insemination station at Križevci, Croatia, during 1948-49 had diseases of the genital system, mainly trichomoniasis. By artificial insemination conception rates of 76.7% and 64% were achieved in two herds which up to 1948 had been infected with *Trichomonas foetus*. K. stresses the importance of artificial insemination in the control of sterility and disease.

—E.G.

EBL, K. (1950.) Erfahrungen aus der Praxis der Deckseuchen-Bekämpfung in Franken. [Control of venereal diseases in cattle in Franconia.]—*Tierärztl. Umsch.* 5. 245-251. 3136

E. describes in detail a disease eradication plan based on the exclusive use of artificial insemination in infected herds and the frequent examination and treatment of diseased cows in the herd; this has proved successful in eradicating trichomoniasis, but has not influenced the occurrence of severe endometritis, cervicitis, cervix hypertrophy or various forms of vaginitis. It is considered that the latter is transmitted from cow to cow when the animals are housed as well as by coitus.—ROY MACK.

LUNDGREN, B. (1948.) Något om kvalitetsbedömning av tjursperma i praktiken och dess inflytande på dräktighetsresultatet. [Judging the quality of bull semen and its influence on pregnancy results.]—*Svensk VetTidskr.* 53. 176-185. [English summary.] 3137

Semen samples from eight bulls used for artificial insemination and serving once a week were subjected to daily qualitative examination over a period of one year. Ordinary naked-eye judgment of density and microscopic assessment of wave formation and motility were carried out after collection of semen samples which were classified into three categories. The semen was usually diluted with GPC 5 and fresh hen's egg yolk, according to its quality varying from 1:6—1:15. The examination covered all inseminations made, including those of sterile or temporarily sterile cows.

Semen of the lowest grade of density and of the lowest grade of wave formation (wave formation absent) was discarded. There was a difference of only 2% between the fertility rates obtained with semen of the two higher grades of density, and between the fertility rates obtained with semen of the two higher grades of wave formation the difference was only 1.3%.

Concerning motility of spermatozoa, semen samples were divided into four grades. In the lowest grade (3—) less than half the spermatozoa

were motile; in the two intermediate grades (3 and 3+) slightly more than half or considerably more than half were motile, and in the highest grade (4) nearly all were motile. The differences between the fertility percentages obtained with the four motility grades of semen, all of which were used for insemination, were: 4.8, 0.8, and 2.7.

A correlation between fertility percentage and motility therefore existed up to motility grade 3. This agrees with the findings of previous American workers.—F.E.W.

BRATTON, R. W., FOOTE, R. H., MUSGRAVE, S. D., & VANDEMARK, N. L. (1949.) Livability and fertility of bovine spermatozoa in different diluents.—*J. Dairy Sci.* 32. 604-608. 3138

A standard semen dilution of 1:200 tried for each diluent on 1,850 cows gave mean fertility levels of 50.5% for phosphate and citrate yolk, whereas the addition of sulphanilamide six parts per thousand raised fertility by 5%. The same improvement was evident with "ortho" dilutor, a preparation containing citrate, sulphanilamide, glucose, etc.—F. L. M. DAWSON.

MIXNER, J. P. (1949.) The effect of a combination of penicillin and streptomycin in semen dilutors on the fertility of dairy bulls.—*J. Anim. Sci.* 8. 642. [Only abst. given; abst. from abst.] 3139

When 1,000 units of potassium penicillin, or 1 mg. of streptomycin calcium chloride were added per ml. of diluent, there was no significant change in fertility level, as compared with controls using egg yolk citrate sulphanilamide diluent. The trials involved 23 bulls and over 3,000 first and second inseminations.

—F. L. M. DAWSON.

MERCIER, E., & SALISBURY, G. W. (1947.) Effect of techniques of preparing semen smears for staining on the morphology of bull spermatozoa.—*J. Anim. Sci.* 6. 60-66. 3140

As the presence of tailless and abnormally formed spermatozoa is used as an indication of poor semen quality, it was decided to test each stage of the routine histological procedure in order to see whether artificial damage occurred. All stages were satisfactory, except clearing the smears with 1% chlorazene. A modified technique eliminating this stage is described. Fresh spermatozoa were found to be more fragile than stored ones.—E. EDEN.

MORRIS, P. G. D. (1950.) Examination of bull semen with the ordinary and phase contrast microscopes.—*Brit. vet. J.* 106. 85-93. 3141

A study was undertaken to decide if the variations seen in the anterior portion of the spermatozoon head were normal. Samples were obtained from bulls of known fertility, some being examined immediately after collection and others after transmission through the post. Spermatozoa density was estimated at 1:200 dilution in saline. Stained films were prepared by the blood smear technique after dilution with distilled water. For phase contrast examination, semen was diluted (2 drops of semen to 4 ml. of isotonic saline).

It was found that the galea capitis of the spermatozoa of normal bulls may vary in appearance, and three types of variation were noticed:—(1) A dark zone immediately behind the anterior portion of the limiting membrane of the galea capitis and separated from the nuclear material of the head by a narrow light zone. This type was found in 27-66% of spermatozoa examined fresh, but only in 0-1% after transmission. (2) A diffuse grey zone immediately below the anterior portion of the limited membrane. This type was found in 3-15% of spermatozoa examined fresh, but only in 0-5 to 2% after transmission. (3) A clear zone between the membrane of the galea capitis and the cranial extremity of the nucleus. This type was found in 36-52% of spermatozoa examined fresh and 74-85% after transmission.

Their significance is briefly discussed.

—D. H. L. ROLLINSON.

EMIK, L. O., & SIDWELL, G. M. (1949.) **Tailless sperm from rams.**—*J. Anim. Sci.* **8.** 67-72. 3142

The changes in spermatozoa during their passage down the epididymis and the effects of various histological treatments are reported. The results indicate that tailless spermatozoa staining only with eosin should be classified as abnormal. Tailless spermatozoa which take no stain or both eosin and opal blue (which stains the post nuclear cap region) are probably normal spermatozoa that have been injured during histological preparation.—E. EDEN.

EMIK, L. O., & SIDWELL, G. M. (1947.) **Refining methods for using opal blue stain in evaluating ram semen.**—*J. Anim. Sci.* **6.** 67-71. 3143

Ram semen was stained with a solution containing 12-5% opal blue and 0-5% eosin. Unfortunately this mixture was unsuitable as a diluting fluid for haemocytometer readings. In smears only dead spermatozoa stained and thus the percentage of live spermatozoa could be obtained by calculation.—E. EDEN.

RAO, C. K., & BERRY, R. O. (1949.) **The cytoplasmic drop and the cytoplasmic**

cap in the development of boar spermatozoa.—*Amer. J. vet. Res.* **10.** 357-360. 3144

Testes and their adnexa removed surgically from four boars aged from 1-5 years were examined histologically, within an hour of removal, by techniques previously described. It appeared that the position on the connecting piece of the cytoplasmic drop was an index to sperm maturity, which has been attained when the drop has reached the posterior end—this usually happens in the epididymal tail. The position of the drop has some correlation with development of motility on incubation in saline. The cytoplasmic cap is present on ejaculated spermatozoa although it is more prominent in the immature cells. The authors consider that the cap may be involved in the secretion of hyaluronidase.—F. L. M. DAWSON.

MUKHERJEE, D. P., & BHATTACHARYA, P. (1949.) **Semen studies and artificial insemination in poultry.**—*Indian J. vet. Sci.* **19.** 79-85. 3145

The authors stress the importance of artificial insemination for rapid development of the poultry industry in India. Comparison of semen samples from indigenous and exotic males reared at Izatnagar revealed significant differences in semen volume, sperm concentration and total number of spermatozoa in an ejaculate, all in favour of the latter breed. The respective average figures were 0-37 ml., 3,256 millions per ml. and 1,237 millions for the exotic males and 0-26 ml., 2,706 millions per ml. and 773 millions for the indigenous males. No significant difference however was observed in initial pH, initial motility and percentage of abnormal spermatozoa in the semen of the two breeds. More than 80% of the eggs obtained from artificially inseminated fowls belonging to both breeds were fertile.—S. S. PRABHU.

DOWLING, D. F. (1949.) **Problems of the transplantation of fertilized ova.**—*J. agric. Sci.* **39.** 374-396. [Author's summary copied *verbatim*.] 3146

The object of this investigation has been to advance knowledge of the methods necessary for the practical application of the transplantation of fertilized ova in cattle. The induction of ovulation at any specific time can be produced by squeezing out the corpus luteum per rectum. Oestrus occurs from 2 to 4 days afterwards; this is accompanied by ovulation and the ova so produced are readily fertilized. The onset of oestrus after the expression of the corpus luteum is hastened by previous treatment with P.M.S. [pregnant mares' serum extract]. The induction of multiple ovulations is necessary to produce an

augmented supply of fertilized ova, but it is of primary importance that the ova so produced are fertilized, viable and capable of full development. Four methods of doing this have been tested.

In the *first method* 3,000 i.u. of P.M.S. were injected subcutaneously in the luteal phase of the cycle (4th to 10th day from oestrus) and the corpus luteum was squeezed out of the ovary 4 days afterwards, the cow being inseminated when she came on heat. Multiple ovulations (average 6-6 and up to 18 ovulations) were obtained, but, although a few of the cases gave a satisfactory response, in some cases there was no response, and in many cases there was overstimulation of follicles in the ovaries with but few ovulations. In these latter cases passage of the ova through the Fallopian tube was accelerated and there was poor fertilization; in all only 38% of the ova were recovered, and of these recovered ova only 38% were fertilized. No intravenous ovulatory dose of L.H. [lutein stimulating hormone] is necessary in the cow and multiple ovulations occur within a short period of one another.

In the *second method* 3,000 i.u. of P.M.S. were injected subcutaneously in the follicular phase of the cycle (16th to 18th day from oestrus) and the cow was inseminated when she came on heat. Many multiple ovulations (average fifteen and up to fifty-one ovulations) were obtained. While this is a better method than the first there were many cases of 'overstimulation' of the ovaries, giving rise to accelerated passage of the ova through the Fallopian tubes, increasing the number of unfertilized ova, and many of those ova which were fertilized had a non-viable appearance (called 'P.M. Sified'). These findings may have a bearing on many of the naturally occurring cases of sterility in the cow.

In the *third method* 100 mg. of horse anterior pituitary extract were injected subcutaneously daily for 3 consecutive days in the follicular phase of the cycle (14th to 20th day from oestrus), and insemination was made when the cows came on heat, usually from 2 to 5 days afterwards. The maximum number of ovulations obtained was twenty-five and the average 6-5. The reactions on the ovary were physiological in that the ova were not noticeably accelerated in their passage down the tube, and over 90% of the ova recovered were fertilized. In the case of the twenty-five ovulations all the ova were fertilized and recovered in the 8-16 cell stage. This was considered to be the most satisfactory method.

In the *fourth method* a subcutaneous

injection of 3,000 i.u. of P.M.S. was given at the time of mid-cycle expression of the corpus luteum. Only one cow was treated in this way. The ovarian response was physiological; there were eighteen ovulations and of the ten ova recovered all were fertilized and in the 8-cell stage.

Since in the cow the ova would have to be transplanted into the uterus, preliminary experiments were made with rabbits to find out the conditions under which this could be done with some degree of certainty. Fertilized superovulated ova from albino does mated with an albino buck were washed out of the Fallopian tubes (62-64 hr. after ovulation in the morula stage) in rabbit blood serum and transplanted into black does which had been mated with a vasectomized buck 24 hr. before the donor albino doe was mated. Thirty-two fertilized ova were transplanted into five does and 78% of these produced normal young, twenty-one of which grew up into normal adults. The certainty of these results is promising for work on other species when the necessary technique has been worked out.

Actual transplantation of fertilized ova in the cow was attempted in eight cases only and in all cases was unsuccessful, due it is considered mainly to the unpromising material used (cows sent for slaughter) and to the fact that many of the superovulated ova used had a non-viable appearance ('P.M. Sified'). A method of collecting ova from the living cow by washing out the ova at the upper end of the uterine horn 4 days after the end of oestrus was successful in two out of six attempts. The ova were collected from the Fallopian tubes of the donor cows by washing out in either homologous or heterologous blood serum, and were transplanted through the cervix into the anterior end of the uterine horn of the host cows with a 'heifer' inseminating tube in a small quantity of cow blood serum.

MATHER, W. B. (1950.) **Artificial insemination in the rabbit.**—*Univ. Qd. Pap. Dep. Biol.* 2. No. 18. 3-5. [Author's summary copied *verbatim*.] 3147

A method of obtaining accurately timed embryonic material in the rabbit by a combination of induced ovulation and artificial insemination is described.

MATHER, W. B. (1950.) **Induced ovulation in the rabbit.**—*Univ. Qd. Pap. Dep. Biol.* 2. No. 17. 3-7. [Author's summary copied *verbatim*.] 3148

A technique of induced superovulation in the adult rabbit, using the commercial preparation Synapoidin, is described and discussed,

together with some observations on the effect of the hormones Serogan and Gonan on the ovary. Some observations on the mechanism and time of ovulation and the "in vitro" fertilizability of the eggs obtained are also described and discussed.

ROWLANDS, I. W. (1949.) **Post-partum breeding in the guinea-pig.**—*J. Hyg., Camb.* 47. 281-287. 3149

Three different breeding methods were compared. In method one both sexes were kept together continuously and the litters born were reared in the same cages. Method two was similar, except that females were separated from males in late pregnancy to avoid post-partum matings. In the third method litters were born and reared with their mothers in separate cages. Of the litters born under method one, 80% were conceived at post-partum oestrus. The annual output was 62% greater than that from colonies bred by method two. The more rapid sequence of littering did not affect the birthweights but the death rate during the first four weeks was five times greater (10%) in communal rearing than in litters reared separately by their mothers. This death rate was highest in the winter months. Intensive breeding is considered by the authors also to affect adversely the health of the females and to lessen their resistance to infection. The optimal ratio of sexes in colony breeding was 12 females to one male.—E. EDEN.

DHARMARAJAN, M. (1950.) **Effect on the embryo of staleness of the sperm at the time of fertilization in the domestic hen.** [Correspondence.]—*Nature, Lond.* 165. 398. 3150

Embryos from eggs laid during the period of isolation of the hen after mating showed more and more abnormalities the longer the time since mating. In general, only organs derived from the ectoderm and mesoderm were affected. These results suggest that the sperm kept in the genital tract of the female for a prolonged time becomes toxic to the zygote.

—E. EDEN.

BOAS, N. F., & LUDWIG, A. W. (1950.) **The mechanism of estrogen inhibition of comb growth in the cockerel, with histologic observations.**—*Endocrinology* 46. 299-306. [Authors' summary copied verbatim.] 3151

The administration of α -estradiol to immature male chicks prevents the normal growth and development of the comb. Histological examination of the combs of estrogen-treated birds revealed the failure to deposit

the metachromatic interstitial ground substance normally seen and the persistence of the immature undifferentiated structure.

α -Estradiol failed to diminish the comb growth response produced by testosterone and gonadotropins, indicating that estrogenic inhibition of comb growth is dependent on the suppression of gonadotropin secretion in the adenohypophysis.

GODFREY, E. F., & JAAP, R. G. (1950.) **Estrogenic interruption of broodiness in the domestic fowl.**—*Poult. Sci.* 29. 356-361. [Authors' summary copied verbatim.] 3152

One hundred and fifty-two broody hens, most of which were in their first laying year, were utilized to test the efficacy of diethylstilbestrol in interrupting broodiness. Fifteen mg. of diethylstilbestrol injected subcutaneously in one ml. of sesame oil solution successfully interrupted broodiness in 28 of 37 hens. Doubling the dosage (30 mg. in 2 ml. sesame oil) resulted in discontinuance of broodiness in 113 of 115 hens.

Estrogenic interruption of broodiness appeared to be as effective as the "broody coop" method when the performance of 13 estrogen and 12 coop treated birds were compared. The number of days elapsing between onset of broodiness and commencement of lay, as well as rate of lay following the broody period, appeared to be about the same for both methods.

The suggestion was made that the high estrogenic level induced by injection of diethylstilbestrol in the hens' body may have interrupted broodiness by a general suppression of the hormonal secretion from the anterior lobe of the pituitary gland.

KAR, A. B. (1949.) **Genital hypoplasia in the juvenile female pigeon due to androgenic treatment.**—*Indian vet. J.* 26. 201-204. 3153

The effect of intramuscular injections of the androgen, testosterone propionate, in sesame oil, on the genital system of juvenile female pigeons was studied and macroscopic and histological changes observed in the oviduct and the gonads described. Androgen treatment caused considerable ovarian and oviducal hypoplasia.—S. GUHA.

HAUBRICH, W. R. (1950.) **Bovine infertility.**—*Vet. Ext. Quart. Univ. Pa.* 50. 62-75. 3154

The treatment of subnormal fertility in the cow is discussed under four main headings:—endocrine, disease, heredity, nutritional, the two latter very briefly.

Cystic ovaries are regarded as of hereditary

nature, but are treated by rupture or surgical drainage of the cyst, coupled with either chorionic gonadotrophin, 100,000 units intramuscularly, or "vetrophen" (follicle stimulating hormone and luteinizing hormone), 10 units or pregnant mares' serum 50-200 Cartland-Nelson units.

Delayed ovulation is treated by 5-10 m.g. of diniestrol subcutaneously at the onset of heat, with mating taking place 8-14 hours later. [The difficulty in diagnosing this condition largely invalidates the results.] Alternative treatment used for delayed ovulation is chorionic gonadotrophin when the cycle is 26 days, in a dose of a 1,000 units intravenously or 5,000 units intramuscularly, or pregnant mares' serum given on the 18th or 19th day after the previous heat, in a dose of 1,500 I.U.

A cystic degenerated corpus luteum is described. H. considers this to be a follicle enmeshed by a corpus luteum. It is treated by removal of the fluid and the introduction of 5,000 units chorionic gonadotrophin intramuscularly. When this condition is spread between the two ovaries (an over-ripe follicle in one ovary, and corpus luteum in the other), diniestrol 5-10 mg. is given at the onset of the next heat, with mating 8-14 hours later.

Atritic follicles, seen in old or debilitated animals, are treated with pregnant mares' serum, 1,000-1,500 units.

Luteal deficiency is treated with 30 mg. of progesterone five days prior to, and five days after, the next three anticipated heats following service, until the 68th day has passed.

Silent heats are said to be a management problem, but this is not elaborated. Pregnant mares' serum 1,000 units 15 days after post oestral bleeding is used.

Vaginitis, indurated cervix and metritis are discussed. 2% acriflavine ointment is recommended for vaginitis and is also used for packing an indurated cervix following service. Penicillin (1,000-2,000 units in 2-5 ml. sterile water) is also used for indurated cervix. The solution is introduced into the middle of the cervical canal at the onset of heat, and service is allowed at the end of the same heat.

Vibronic abortion is discussed at some length; in heifers H. considers the disease self limiting in from 6-12 months, while in older animals a three-month rest period is suggested. Streptomycin is used in treatment of vibronic abortion with encouraging results. It is used in cows as an intra uterine infusion on the second heat following abortion, for three weekly treatments (2 g. in 50 ml. water). In heifers, 1 g. in 10 ml. is infused into the body of the

uterus at the onset of oestrus, insemination being effected 8-10 hours later.

—D. H. L. ROLLINSON.

MÜLLER, E. (1949.) Einige Beobachtungen über das Auftreten des Bläschenausschlages und des Scheidenkatarrhs des Rindes. [*Exanthema coitale vesicularis and vaginal catarrh in cattle.*]—*Wien. tierärztl. Mschr.* 36. 183-189. 3155

Sixty-seven cows and heifers in 31 herds in Austria were clinically examined with reference to sterility. Vaginal catarrh was present in 30 and M. obtained evidence that this was venereally transmitted and not otherwise. Many cases of sterility were ascribed to the catarrh, especially when a catarrhal or purulent metritis was also present. Trichomonads were not present in the locality. In the treatment of these conditions 0.5% chloramine was used with success.—J.E.

KÜST & SCHAETZ. (1949.) Das Surfen-Jod-Gemisch in der Unfruchtbarkeitsbekämpfung bei Rind und Stute. [*Surfen-iodine mixture in control of sterility in cow and mare.*]—*Tierärztl. Umsch.* 4. 189-191. 3156

In order to conserve supplies of iodine, a mixture of surfen, an internal antiseptic similar to acridine, and iodine, consisting of 8 ml. of 2% w/v surfen solution and 4 ml. 5% tinct. iodine made up to 1,000 ml. with water, was used for uterine irrigation. The solution is non-irritant and non-toxic and gave excellent recovery rates in the treatment of metritis in cattle but not in mares since haemolytic streptococci appear to be resistant to the preparation.—J. A. NICHOLSON.

GARM, O. (1947.) Om undersökningar av endokrina organ i samband med cystisk äggstocksdegeneration hos ko. [*Examination of the endocrine glands in connexion with cystic degeneration of the ovaries in cows.*]—*Svensk VetTidskr.* 52. 32-43. 3157

G. distinguishes between follicular cysts (all cysts without lutein tissue) and lutein cysts (those with lutein tissue in the walls).

Reproductive organs from 26 cows with cystic ovarian degeneration were examined bacteriologically, the findings being negative in all cases. The histories of cases examined later did not suggest that endometritis accompanied or preceded the condition. Calving had been uneventful and the placenta had been discharged normally. Only in a few isolated cases had cows had a mucopurulent discharge after calving. G. considers that other authors who stated that endometritis is invariably present in connexion with (and is probably the

cause of) cystic degeneration must have interpreted as chronic endometritis those changes in the uterine mucosa which G. considers to be purely proliferative processes (hyperplastic processes resulting from the prolonged influence of oestrone from follicles and cysts).

The histological picture in cows with follicular cysts is contrasted with that in cows with lutein cysts. A detailed account is given of the histopathology of the endocrine glands in each condition.

In the pituitary gland in cows with lutein cysts G. found pathological basophile cell forms in several stages of development. In the adrenal glands, intracellular fuchsinophile granules occurred in large numbers in the reticular zone, as also in the cortical tissue nodules of the medulla. In the ovaries there was usually a single lutein cyst and occasionally more than one, and luteinized atretic follicles were often present in great numbers. The stroma was frequently sclerotic. When cysts were absent in one of the ovaries, this ovary was often found to be more or less atrophied. Changes were absent in the pineal gland, thyroid, parathyroids and pancreas. G. also describes psychic disturbances and alterations in the oestrous cycle in cows with lutein cysts. He considers that the condition may be termed an androgenital syndrome.

Changes in the endocrine glands of cows with persistent follicles and follicular cysts are also described. Changes were present only in the pituitary gland and the ovaries. Disturbances in the oestrous cycle and psychic disturbances associated with this condition in cows appear to be more variable than those associated with lutein cysts.

For comparative purposes G. studied the genital organs and endocrine glands of a large number of normal cows of various ages and stages of lactation. The basophile cells found in the pituitary gland in old cows were found to be distinct from those demonstrated in cows with lutein cysts.

In hormone investigations made on a number of the cases, using the photometric analysis method, it was not possible to demonstrate oestrogenic substances in the urine of cows with ovarian cysts, the amount present even in cows with persistent oestrus being too small to be shown. Androgenic substances in the urine of cattle were determined photometrically and it was found that there appeared to be a correlation between the number of fuchsinophile granules in the adrenal gland and the occurrence of androgenic substances in the urine. Determination of gonadotrophic hor-

mones in the urine or in the blood presented the same difficulties as that of the oestrogenic substances and was therefore not attempted in this study.

G. considers that dysfunction of the pathologically changed basophile cells of the anterior pituitary gland with consequent disturbance in the production of gonadotrophic hormone is the cause of both types of cyst formation, but that in the case of lutein cysts, besides the pituitary disturbance there is also an excess production of androgenic substances in the adrenal gland (as indicated by the occurrence of numerous intracellular fuchsinophile granules in the adrenal cortex).—F.E.W.

DAWSON, F. L. M. (1950.) **Bovine endometritis—a review of literature to 1947, with special reference to the catarrhal type of the disease.**—*Brit. vet. J.* **106**, 104-116. 3158

In this review the development of two divergent views on the cause and treatment of endometritis is discussed. One school of thought considered infection to be the operating factor and advocated the use of disinfectants such as iodine. Others considered that the lack of a follicle rupturing principle was the primary cause and used as a remedy mechanical rupture of the corpus luteum. Although so far not much controlled experimental work has been done, the available evidence is in favour of the second view.—E. EDEN.

AMBACHE, N., & HAMMOND, J., JR. (1949.) **Activity and drug responses of the sheep uterus in relation to reproductive condition.**—*J. Physiol.* **108**, 270-277. 3159

The authors studied the responses of surviving uterine muscle, *in vitro*, to adrenalin, acetylcholine and oxytocin. Portions of uteri were obtained from eight ewes in normal anoestrus; 16 ewes at various known stages of pregnancy; and six ewes in anoestrus but treated with pregnant mare's serum or oestrogen. The method of sampling the muscle is discussed at length in particular relationship to the type of spontaneous activity which was revealed.

The chief differences of activity were between pregnant and non-pregnant uteri. The administration of P.M.S. or oestrogen did not give clear cut results.

It was found that spontaneous activity diminished in the presence of a corpus luteum. In late pregnancy the sensitivity to oxytocin increased markedly and the effect of this drug persisted long after it had been washed out. Oxytocin administration augmented the motor effect of acetyl choline. It is known that with adrenalin, in non-pregnant uteri there is a motor

response and in parturient uteri an inhibiting effect in sheep. In these experiments it was found that as pregnancy advanced the threshold dose of adrenalin for a motor effect increased, whereas the threshold for an inhibiting effect decreased. Both effects could be seen at the same stage of pregnancy with suitable doses.

See also absts. 3067 (birthweight of calves); 3073 (nutrition of bulls used in artificial insemination); 3162 (caponizing with the aid of hormones).

ZOOTEC HNY

GAZTAMBIDE, C. (1949.) **The effects of environmental temperature and relative humidity on acclimation of cattle in the tropics.**—*J. Anim. Sci.* 8. 637. [Only abst. given; abst. from abst.] 3160

The effect of air temperature (85°F.) and humidity (63%) on the body temperature, pulse and respiratory rate, haemoglobin and milk production was studied. The animals used included dairy (Holstein, Guernsey, Jersey, Ayrshire, Brown Swiss) and beef (Hereford, Shorthorn, Brahman) breeds. Brown Swiss and Jersey cows showed the best adaptation to semi-tropical environment.—E. EDEN.

CLARK, R., & QUIN, J. I. (1949.) **Studies on the water requirements of farm animals in South Africa. I. The effect of intermittent watering on Merino sheep. II. The relation between water consumption, food consumption and atmospheric temperature as studied on Merino sheep.**—*Onderstepoort J. vet. Sci.* 22. 335-343, & 345-354. 3161

I. In some parts of South Africa, sheep are watered at intervals of two or three days. A small trial was arranged to show whether or not this long interval between watering has an adverse effect on the sheep. Access to water for one hour every second day had no adverse effect on the intake of water when the sole diet was grass hay. When water was given at 72 and 96 hour intervals, the total intake of water was decreased to 63 and 54% of the normal respectively, but this did not affect the consumption of hay. When lucerne hay was the sole diet, consumption was markedly depressed even during the first 24 hours of thirsting; however, sheep receiving water only twice weekly gained in body weight.

II. Sheep were divided into three groups: (1) received food and water *ad lib.* (2) received food *ad lib.*, but only 2 l. of water daily, and (3) received water *ad lib.*, but only 0.6 kg. food daily. Lucerne hay was the sole food. A highly significant positive correlation was found between the amounts of hay and water consumed when both were offered *ad lib.*, and between the

In advanced pregnancy adrenalin was found to inhibit acetylcholine-induced contraction. The authors interpret their findings in relation to the production of progesterone and oestrogen, especially at the end of pregnancy.

—R. J. FITZPATRICK.

amount of water consumed and the maximum atmospheric temperature for the day. Sheep on a restricted water supply maintained a low water to food ratio by passing small amounts of highly concentrated urine (urea up to 8.1 g. per 100 ml.).—G. B. S. HEATH.

WESTERMARCK, H., & AALTONEN, Å. (1950.) **Om kapunering av tuppar med stilbestrol. [Caponization of cockerels with stilboestrol.]**—*Nord. Vet.-Med.* 2. 405-414. [English and German summaries. Abst. from English summary and conclusions.] 3162

Implantation of stilboestrol primarily improves the quality of the meat by increasing the fat content of the musculature in Leghorn cocks from 5.8% to 13.1%, in Rhode Island cocks from 8.5% to 19.6%. Also the fat content in the liver increases from 12% to 27% by simple fattening. There is also a tendency to increase the total weight of the cocks, although less pronounced.

Implantation of stilboestrol tablets causes complete caponization of the habitus of the experimental cocks. The greater the sexual activity of the cock, the larger the dose of stilboestrol required.

BRAUDE, R., & WALKER, D. M. (1949.) **Mortality, weight and body measurements at birth of Dairy Shorthorn calves.**—*J. agric. Sci.* 39. 156-163. 3163

In the period 1924-46 there were 584 established pregnancies that resulted, or could have resulted, in the birth of heifer calves. In 95, or 16.3% of cases, there was failure to produce a calf that lived to six months of age. In 65, or 11.3% of cases, the losses were pre-natal, and this high value may have been due to two outbreaks of contagious abortion. Abortions were responsible for 5.1% and stillbirths for 6.3% of pre-natal losses. The remaining 28 losses, representing 4.8% of established pregnancies, represented deaths during the first six months of post-natal life. Of these, three were attributed to birth abnormalities and two to the presence of foreign bodies, seven were born as freemartins, and

sold, six were diagnosed as having gastrointestinal disease and two as having pneumonia, while in eight instances the cause of death was not ascertained. (The data of necessity exclude any possible losses very early in pregnancy and a similar limitation is imposed upon all studies that cannot include a detailed examination of the ovaries and implantation sites of the dams).

During the years 1940-47 the weights within 24 hours of birth were recorded for 230 calves, and the data were subdivided into 20 classes according to number (1 to 5) of "lactation" of the dam, sex of calf, and whether conception had resulted from mating or from artificial insemination. The mean gestation period for first and second pregnancies was 284.62 days, and that for the third to fifth pregnancies 286.28 days, the difference between the means being 1.66 days with standard error of ± 0.710 days. Calves from a longer gestation period tended to be heavier at birth, the average increase in weight being 0.91 ± 0.0924 lb. per day of gestation. The relationship between birth weight and gestation period did not appear to be affected by sex of calf, age of dam, or the manner of insemination. Substantial differences were apparent between the weights of bull and heifer calves, and between calves born from different pregnancies. Bull calves were carried on the average 1.68 days longer than heifer calves, but even allowing for this their weight at birth was 3.29 lb. heavier. Seasonal differences were not apparent in a study of all heifer calves born from 1923-39 [cf. Phillips, R. (1946) *Nature, Lond.* 158. 202]. The mean birth weight during the war years (79.9 lb.) was less than that (87 lb.) during the pre-war years.

An extended series of body measurements of new-born calves and their dams was undertaken. A close relationship was found between birth weight and body measurements in the calves, the correlation being best with girth of chest, height at hocks, length of body, and height at withers, respectively, and least with width of head. The order of correlation was the same in measurements and body weight of dams.

It was shown that while a cow was growing (or increasing in body measurements) there was an increase in the size of its calves up to the third calving. There was, however, not any direct relationship between the size of a mature cow and that of its calf.—ALASTAIR N. WORDEN.

BENJAMIN, K. T., & RAJU, K. K. (1949.)
Colour in Kangayam breed.—*Indian vet. J.*
25. 447-448. 3164

The coat colour changes of Kangayam cattle,

a draught breed of South India, are described. The calves are light or dark brown with grey or white on the inside of the thighs, ears and forelegs, and occasionally grey or white rings on the pastern and fetlock. The switch is black. At two years, the heifer turns grey or dark grey and the cow retains this colour all her life, [becoming lighter, almost white, with advancing age.—Ed. V.B.]. The male calf becomes darker grey or iron grey with black shading over the head, neck, hump, dewlap and fore and hind-quarters, the withers generally being black. With maturity the black shading becomes intensified and remains so for life. Well defined dark rings around the eyes have also been observed [castrated males have the colour of cows—Ed. V.B.]. The hairs remain short, giving a glossy coat. Definite changes in colour indicate purity of breed.

—M. P. JOHARI.

BROWNIE, W. M. (1949.) Observations on the performance of sheep breeds other than the Scottish black-face on an Argyllshire hill farm.—*Trans. Highl. agric. Soc. Scot.* 5th Ser. 61. 32-55. 3165

Because tups which have been reared on lowland pastures frequently die, or fail to thrive well on hill grazings, flockmasters tend to think that the good feeding in early life has made them "soft"; probably their poor performance on the hill grazing is due to lack of resistance to diseases, particularly tick borne, which they encounter for the first time on the hill.

Small flocks (about 30) of Cheviot, Welsh, Kerry Hill, Swaledale, Gritstone and Shetland sheep were imported to a Scottish Blackface grazing. On the whole, the experiment was successful, and it appears that Swaledales might possibly be used to replace Blackface on this grazing. Results of the experiment are given in detail.—G. B. S. HEATH.

TRIBE, D. E. (1950.) Influence of pregnancy and social facilitation on the behaviour of the grazing sheep. [Correspondence.] —*Nature, Lond.* 166. 74. 3166

A group of 25 Blackface ewes at pasture received a supplement of linseed cake meal and crushed oats; a similar group received no supplement. During separate grazing in adjacent and botanically similar fields, the supplemented group spent less time in grazing and more time in resting than the unsupplemented group but, when the groups were run together, the supplemented group imitated the other sheep. Ewes which were carrying twins and receiving the supplement grazed for one hour longer than those in the same group which were carrying single lambs. In the group which was

not receiving the supplement, ewes carrying twin lambs did not graze for longer periods than those carrying singletons, and T. thinks that

See also abstr. 3067 (birthweights of calves).

this fact may be explained by the inevitable fatigue produced by long hours of grazing.

—G. B. S. HEATH.

TECHNIQUE AND APPARATUS

(1948.) **Specimens for laboratory examination.** pp. 32. Wallaceville, N.Z.: Wallaceville Animal Research Station. 3167

This booklet, published by the New Zealand Department of Agriculture, has been compiled by officers of the Wallaceville Animal Research Station after consultation with officers of the Livestock Division of the Department for use by the latter and practising veterinarians as a guide to the selection and forwarding of samples for laboratory examination for the diagnosis of animal diseases.

The object of the booklet is to ensure that as wide a range of suitable specimens is taken as will enable the carrying out of satisfactory laboratory examination for diagnosis.

The main subject matter has been arranged alphabetically, with cross-referencing where necessary, to enable rapid and easy location of the data.

Each disease listed is characterized or defined, and following this a brief description is given of the laboratory diagnostic examination required to confirm the disease, and a list of specimens required, from the live or dead animal or both, for these examinations. Examples of suitable notes on the methods of collection and dispatch of specimens are included where special precautions or preservative methods are required.

Sections are included on blood and pus sample collection technique and the preparation of smears, sampling from the various body systems and organs for general purposes, urine and milk collection and the collection of parasites for identification.

Supplementary information includes notes on important infectious diseases of livestock not present in New Zealand, maps showing the known cobalt and copper deficient areas of New Zealand, the distribution of some parasitic diseases of livestock, and two host-parasite lists for New Zealand, (a) those recorded and (b) those as yet unrecorded.

The booklet is for private circulation, and this first edition is in temporary form, pending revision and amplification.—J. B. SWAN.

CHAMBERS, C. W. (1950.) **Relationship of coliform bacteria to gas production in media containing lactose.**—*Publ. Hlth. Rep., Wash.* 65. 619-627. [Author's conclusions copied *verbatim*.] 3168

Results obtained with the cultures used in this study indicate that from 40 to 390 millions of coliform bacteria per ml. are required to produce visible gas in lactose broth. The arithmetic mean and the median for 780 determinations was approximately 170 million per ml. Different coliform cultures vary in the population density required to produce gas. In most instances coliform counts of 75 million or more per ml. are required to produce the first visible gas. The number of coliform bacteria originally inoculated into lactose broth has relatively little effect on the population density required to produce gas, but does have a marked effect on the time necessary for gas production.

Results from single and double strength media show no significant variations in the number of coliforms required to produce gas. The population required to produce gas in standard lactose broth is about 40 per cent. less than that required to produce gas in B.G.B. [brilliant green bile] broth 2 per cent. The production of gas in any quantity in the presumptive test in lactose broth is highly significant until proved otherwise by subsequent confirmatory or completed tests.

GRAY, M. L., STAFSETH, H. J., THORP, F., JR., SHOLL, L. B., & RILEY, W. F., JR. (1948.) **A new technique for isolating listerellae from the bovine brain.**—*J. Bact.* 55. 471-476. 3169

In three of five cases of bovine listerellosis [*Erysipelothrix* (*Listeria*) *monocytogenes* infection] isolations were made on tryptose agar after the brain suspension had been refrigerated for 5-13 weeks. It is suggested that some inhibitory substance may be present in the bovine brain which prevents primary isolation but is "destroyed" by refrigeration.

—MALCOLM WOODBINE.

HANSEN, E. L. (1950.) **A liquid medium composed of dehydrated ingredients for culture of *Endamoeba histolytica* associated with a single bacterium.**—*J. Lab. clin. Med.* 35. 308-312. [Author's summary slightly amended.] 3170

An essentially liquid medium prepared with readily available dry ingredients is described for the cultivation of *E. histolytica* associated with a monobacterial flora. The use of the medium is illustrated by application to

the in vitro testing of the amebicidal action of new agents.

SEGHE'ITI, L. (1950.) **An improved method of mixing fecal suspensions for nematode egg counts.**—*Proc. helminth. Soc. Wash.* 17. 26-27. 3171

S. used the sugar flotation technique preparing the suspension of faeces with an electric mixer, thus simplifying the process, saving time and producing a more homogeneous suspension.—JAS. G. O'SULLIVAN.

SAIKI, A. K., & KLING, R. R. (1949.) **A method of automatic dehydration for histological technique.**—*Science* 109. 449. 3172

The instrument used is a modified Soxhlet apparatus having an overflow drainage as indicated in a diagram. The tissues are placed in the chamber and the extractor filled with the dehydrating fluid (preferably one with a relatively low boiling point). The flask is filled three quarters full with the fluid and 80-100 g. of calcium carbide are added. The apparatus is now mounted on a thermostatically controlled hot plate. As the dehydrant is refluxed the anhydrous condensate enters the bottom of the extracting chamber, circulates through the tissues and finally overflows back again into the flask.—L. M. MARKSON.

STEEDMAN, H. F. (1949.) **An ester wax for use in the tropics.**—*Nature, Lond.* 164. 1084-1085. 3173

See also abst. 3016 (drying of rinderpest virus).

As a substitute for ordinary paraffin wax for cutting histological sections in warm climates S. advocates the use of an ester wax, the composition of which is given; the chemical properties and the histological performance are also described. This wax is not suitable however for use in climates where the room temperature is below 70° F.—E. EDEN.

ALLAM, M. W. (1948.) **Sterilization—aseptic technique in veterinary practice.**—*J. Amer. vet. med. Ass.* 112. 338-342. 3174

This is a brief account of methods of sterilization which ought to be used in general surgical practice.—K. G. TOWERS.

HOFSTAD, M. S. (1950.) **A method of bleeding chickens from the heart.**—*J. Amer. vet. med. Ass.* 116. 353-354. 3175

Manipulative details for heart puncture of chicks 4-12 weeks of age are given. This was found to be a rapid and safe method (less than 1% mortality).—E. EDEN.

SHORT, D. J., & PARKES, A. S. (1949.) **Drinking spouts for laboratory animals.** [Correspondence.]—*Nature, Lond.* 163. 292-293. 3176

An account of a metal drinking spout that is more suitable for small laboratory animals than the bungs and glass stems commonly fitted to inverted bottles. The spouts are cheap.—ALASTAIR N. WORDEN.

MISCELLANEOUS

ANON. (1949.) **Silver Jubilee Number of the Indian Veterinary Journal.**—*Indian. vet. J.* 26. pp. 1-162. 3177

This number has been published in connexion with the 25th anniversary of the Indian Veterinary Journal. It contains a number of articles dealing with the progress of veterinary science in India and with the problems of Indian veterinarians. A few scientific articles have also been included. The activities of the Indian Army Remount and Veterinary Services, of the Central Veterinary Research Institute at Mukteswar and Izatnagar, and of the various state veterinary departments and colleges are dealt with. Brief summaries of the articles are given below.

DATTA, S., stresses the urgency of the establishment of an Indian Veterinary Council which will be able to enforce a uniform standard of education in the Indian veterinary colleges, and to look after the interests of veterinarians. LALL, H. K., advocates the provision of better facilities for veterinary research in India. The

next two articles by SASTRY, M. S., and MUDALIYAR, T. V., respectively deal with the history of the All-India Veterinary Association and of the publication of the Indian Veterinary Journal.

There is an original article by KING, J. O. L., on variation in the body temperature of dairy cows and its influence on milk composition [see abst. 3115]. DHANDA, M. L., and RAJAGOPALAN, V. R., summarized the salient features of brucellosis and its causative organism and described methods of diagnosis of this disease. They also discussed the various methods of prophylaxis and control. LAPAGE, C., outlined the organization of a modern department of parasitology in a university. IYER, S. G., described the evolution through selective breeding of an improved indigenous strain of fowl in the poultry farm of the Indian Veterinary Research Institute at Izatnagar. These birds compare very favourably with the exotic breeds as regards egg and meat production and egg quality. This breed is also quite economic as the birds have a significantly low food con-

sumption. There is a paper by BALAKRISHNAN, C. S., and YERAVDEKAR, S. N., on blood groups in horses [see abst. 3031].

The remainder of the journal contains reports of veterinary departments, research institutes and colleges in various parts of India. There are photographs of several college buildings and of some of their staffs and of pioneers of the profession in India.—S. N. RAY.

HUME, C. W. (1949.) **How to befriend laboratory animals.** pp. 16. London: UFAW. 3d. 3178

The history of legislation affecting animal experimentation in Great Britain is reviewed, and salient features of Chapter I of the *UFAW Handbook on the Care and Management of Laboratory Animals* [V.B. 18. 239] are repeated. It is argued that the "abolitionist" policy of anti-vivisectionists is impracticable and unrealistic and that attempts to enforce it are bound to fail. In Great Britain, though not necessarily in other countries, the standard of treatment of animals under experimentation is high, and while the Cruelty to Animals Act

(1876) may need improvement, a kind of gentlemen's agreement has grown up between the scientists and the Home Office so that a unique degree of protection is afforded to laboratory animals.

There is, however, little room for complacency and certain constructive measures are suggested, including the use of statistical methods to ensure the minimum number of animals for experiments of a painful character, and enlargement of the Home Office Inspectorate (now confined to medical men but which should include veterinarians and zoologists) so that advice can be disseminated more frequently and adequately to experimentalists.

It is pointed out that public sentiment (and to some extent scientific consideration also) tends to concentrate upon those species, such as the dog, cat and horse, which are popular domestically. The case of other species is equally important if judged objectively. Analysis of current statistics indicates that only some 9% of animal experiments in Great Britain involve any operative procedure.

—ALASTAIR N. WORDEN.

REPORTS

(1948.) **Great Britain. Annual Report of the National Institute for Research in Dairying, University of Reading, for the year ended 30th September, 1948.** pp. 72. Shinfield, Reading: National Institute for Research in Dairying. [Items of veterinary interest, pp. 14-41, 47, 50-57.] 3179

The report for 1948 continues to show a large and varied amount of research work, much of which is of interest to the veterinary profession. There are six departments of the National Institute responsible for this work:—those of Dairy Husbandry, Feeding and Metabolism, Physiology, Bacteriology, Nutrition and to some extent that of Chemistry.

The attested dairy herd of the Institute consists of 139 Shorthorns, 19 Guernseys and 18 Friesians, most of the cattle being pedigree or eligible for grading up. The herd depends almost entirely on the Reading Cattle Breeding Centre for artificial insemination. During 1946-47, 74 cows were listed for service and all were artificially served. 64% held to the first service, 14.9% to the second, 10.8% to the third, and altogether 95.4% eventually conceived. A study is being made of the fertility records collected over the last ten years.

There was a marked increase in sub-clinical MASTITIS without a corresponding increase in the clinical form. There was a rather severe attack of HUSK among both young stock and

cows. Control measures included the intratracheal injection and dosing with phenothiazine along with careful grazing management. Two yearlings died and a number lost condition, but control of the attack was achieved in about 3-4 weeks.

In work on the technique of milking, it was shown that normal milking removes only about 80% of the milk and about 50% only of the fat present in the gland immediately before milking.

Under the section dealing with Feeding and Metabolism, factors affecting the efficiency of food utilization of ruminants was studied and the factors affecting SCOUR IN YOUNG CALVES such as the effect of warm milk and milk reduced to a low temperature. A large number of other feeding experiments were carried out, such as a test on the value of grass silage versus mangolds for young dairy cattle.

The Department of Physiology investigated the effect of hormones on mammary growth and lactation, the physiology of milking and matters dealing with reproduction.

The Bacteriological Dept. carried out work on the resazurin test, tests on the sterilization of dairy utensils, the effect of the administration of penicillin on the bacteriological quality of milk and many other experiments including a continuation of its study of MASTITIS. A study of colostrum as it affects the health of the

new-born calf was a part of the report of the Chemical Department.

The Department dealing with nutrition reports on its study on protein, researches on the nutritional role of the microbial population of the alimentary tract and on the nutritional significance of colostrum.—D. S. RABAGLIATI.

PUTNAM, F. (1947.) **Canada. British Columbia. Forty-second annual report of the Department of Agriculture for the year 1947.** pp. 189. Items of veterinary interest pp. 106-135. Victoria, B.C.: Don McDiarmid. 3180

Many horses are being sent to processing plants for livestock feeding and for export shipments of horse meat, but the demand for riding horses remains strong.

HAEMORRHAGIC SEPTICAEMIA, BOVINE COCCIDIOSIS, EQUINE ENCEPHALOMYELITIS, and CASEOUS LYMPHADENITIS have been encountered during the year, but are not now of any great importance. NECROTIC STOMATITIS, BLACKLEG, FOOT ROT, MASTITIS, SWINE ERYSIPELAS, and SWINE RHINITIS are common and very harmful to the stock raising industry. The policy of calfhood vaccination against BRUCELLOSIS is making good headway. Artificial insemination has been hampered by lack of funds and unexpected administrative difficulties.

By persistent use of derris dust, ox warbles have been practically eradicated from some areas of the province.—G. B. S. HEATH.

(1948.) **India. United Provinces. Annual administration report of the Animal Husbandry Department, United Provinces, for the year 1946-47.** pp. 61. Allahabad: Supt. Printing & Stationery. Re. 1-5-0. 3181

The staff consisted of 31 gazetted officers including the Director and 816 subordinate officers as against 25 gazetted and 740 subordinate officers in the previous year. The total expenditure of the department for the year was Rs. 3,528,641/- as against Rs. 2,750,628 in the previous year.

There was a decrease in the mortality due to RINDERPEST and HAEMORRHAGIC SEPTICAEMIA, the most common diseases, the deaths being 17,826 and 7,353 as against 21,108 and 8,362 respectively in the previous year. Deaths caused by BLACKLEG were 545 as against 1,669 in the previous year. ANTHRAX caused 356 deaths and SURRA 405, of which only 5 were in equines. 366,430 bovine animals were protected against RINDERPEST compared with 412,874 in the previous year. 87,011 fowls were protected against Newcastle Disease, 1,770 against fowl spirochaetosis, 11,487 against

fowl pox and 2,658 against fowl cholera. Tuberculosis is very rare among fowls. Of 242 fowls tested only one yielded a positive reaction. Inoculations against different diseases are tabulated.

In the 206 veterinary hospitals in the province 7,216 bovine, 3,296 equine and 899 other animals were treated as in-patients; 585,874 bovine, 77,129 equine and 124,101 other animals as out-patients; 100,650 cases were supplied with medicines and 225,083 castrations were performed. The touring staff treated 80,223 cases of contagious and 61,462 of non-contagious diseases. Incidence of LIVER FLUKE DISEASE as a result of a survey of 36 villages was found to be 49.6%.

Experiments with D.D.T. on dog ticks showed that it was lethal in concentrations of over 10% and the residual effect lasted up to two weeks. Investigations and experiments revealed that the distribution of the poultry tick *Argas persicus* was numerous in dry and warm areas, the incubation period of the eggs 6-9 days and the viability of the larvae in the absence of a host 60-113 days under varying climatic conditions. For the eradication of seed ticks derris dressing in a concentration of 10% proved effective but it was toxic to very young chicks even at 5%.

Large-scale manufacture of vaccines was carried out during the year. 553,400 doses of RINDERPEST vaccine including 29,000 doses of desiccated vaccine were supplied as against 545,200 doses in the previous year. Preparation of RINDERPEST pill vaccine was continued. Glucose peptone vaccine pills gave better results. Pills kept at room temperature in the dark during January to March proved potent up to 14-21 days.

Comparative feeding values of different straws such as wheat, barley, Indian and pearl millet and paddy and sugarcane tops and the concentrates suitable for feeding with them were studied on milch cows and buffaloes and the findings reported.—M. K. SREENIVASAN.

(1949.) **Colony of Mauritius. Annual Report of the Department of Agriculture, 1948.** pp. 80. Items of veterinary interest pp. 45-49. Port Louis: J. Eliel Fleix, Govt. Printers. R.1. 3182

Veterinary science would appear to take a minor place in the agricultural activities of Mauritius.

The Government breeding herds were tested for TB. and out of 66 cattle tested, none was found to react. A table is included showing the result of an agglutination test against CONTAGIOUS ABORTION and out of 179 animals

tested, 80 proved to be positive. As the result of this test it was decided to inoculate the calves with strain 19 vaccine.

It is stated that 3,000 animals, presumably cattle, were examined for TRYPANOSOMIASIS and all were found to be free.

A short note is given on animal husbandry operations and a table is included indicating the number of animals slaughtered. Permits

were given during the year for the slaughter of 2,016 discarded heifers and cows. The number of animals imported is stated, the largest importations being 5,837 bullocks from Madagascar. The abattoirs were occasionally visited by a veterinary officer, but no condemnations were made. Veterinary lectures were delivered to agricultural students.

—D. S. RABAGLIATI.

BOOK REVIEWS

WEYL, A. (1950.) *Neue Wege zur Bekämpfung der Tuberkulose des Rindes unter Berücksichtigung der Wechselbeziehungen "Rindertuberkulose-Kindertuberkulose"*. [Control of tuberculosis in cattle and its relation to tuberculosis in children.] pp. 118. Hannover: M. & H. Schaper. DM. 3.60. 3183

This booklet grew out of an instructional course for veterinarians of Lower Saxony on the subject of tuberculosis and its control, for which a new scheme has been put into operation.

The booklet contains five chapters, devoted respectively to Bovine TB. in Lower Saxony, by Weyl; TB. and allergy, by Wagener; the intradermal tuberculin test, by Goetze; cattle breeding and TB., by Ranke; and official regulations for the new scheme.

The first chapter is of the greatest general interest. Although statistical information is fragmentary there are figures to show that the incidence of bovine TB. has, if anything, increased during the last 12 years. In 1936, 20,000 cattle in one district of Lower Saxony were tuberculin-tested and 50% reacted, whilst 32% of 30,000 in another district reacted. The incidence was even higher in herds enrolled in the Ostertag control scheme than in uncontrolled herds. Evidence was also obtained that cattle could become infected equally well, standing in rows head to head or tail to tail, the operative factor being infected dust in a roofed byre. In 1949, 410 cattle in 15 herds were tested: 41.5% were positive, and 22% and 25% respectively reacted positively in two further groups of 300 and 394 animals. In severely infected herds 90% of the cows and 25-30% of the young stock were reactors. It is estimated that the annual loss from TB. in the two million head of cattle in Lower Saxony amounts to 35 million DM. of 1937 currency (1949 equivalent 52½ million DM.). The incidence of bovine type TB. in man in Lower Saxony is not known: some figures from elsewhere are quoted as suggesting that the bovine type is important.

The new control plan for Lower Saxony is a 6-year voluntary scheme for increasing the number of TB.-free herds and it is based on

the intradermal tuberculin test. Reactors are disposed of as energetically as economic conditions permit, though all cases of udder TB. are slaughtered soon after their detection and compensation is paid. Farmers contribute DM. 1.60 per animal and the state expects to provide DM. 200,000 annually. A milk price premium is not contemplated, but owners of herds still infected after six years will receive a lower price than owners of "clean" ones.

Wagener's chapter is a concise review of the subject and so is Ranke's. Goetze describes the tuberculin test in current use in Germany. It is the single injection intradermal test with tuberculin prepared either from broth or synthetic medium cultures of bovine type bacilli. The result is read in the course of the fourth day and is judged on criteria of skin thickness, tenderness and warmth of the site of injection. A skin caliper showing the reading on a dial is used. Cattle are also examined clinically and bacteriologically in appropriate cases.

The booklet describes the scheme in detail including the administrative aspect.—J.E.

GRIESBACH, R. (1949.) *Neuere Tuberkuloseforschung I. Verhandlungsbericht des ersten Kongresses der Wissenschaftlichen Gesellschaft süddeutscher Tuberkuloseärzte vom 25-27 September 1948 auf dem Nebelhorn bei Oberstdorf/Allgäu. [Report on a congress of South German TB. specialists.]* pp. 112. Stuttgart: Georg Thieme, DM. 6. 3184

At a congress of South German TB. specialists, Trautwein spoke on TB. in domestic animals as the source of human infection stating that in Germany 10% of cases in man are contracted from domestic animals, mainly from cattle and pigs.

In Germany the incidence of the disease in cattle and pigs has been increasing steadily during the last 24 years. In 1924, 19.5% of beef carcasses and 2.02% of pork carcasses were infected. In 1935 the numbers were 26.5% and 2.88%. During and after the second world war the situation became even more serious. In 1948 the total loss per year, including losses

incurred through condemned meat, milk, loss in weight and lowered production of calves was estimated at 350,000,000 DM. for a cattle population of about 18 million head. The commonest source of infection is milk and milk products, but lately increased attention has been given to air-borne infection. Infection by consumption of infected meat is negligible owing to the high standard of meat inspection.

It was estimated that in Germany in the years before and during the war approx. 1,000 people per year died of bovine type TB. and a considerably larger number became infected. The standard of pasteurization and production of TB.-free milk deteriorated during the two world wars.

T. advocated the stamping-out method based on the intradermal tuberculin test.

Geiger, J., enlarged on the economic aspects of bovine TB. in Germany and Müller, R. W., discussed bovine type TB. in man from the physician's point of view.—E.G.

TRUMIĆ, P. (1948.) Zaraze domaćih životinja.

I. [Veterinary epidemiology and immunology.] pp. 209. Beograd: Izdanje Naučne knjige. 13s. 3185

This textbook is intended as an elementary study for veterinary students and is divided into three sections dealing with the principles of immunology, virus disease and epidemiology. The sub-headings on the section on immunology are:—infection, basic symptoms and pathogenesis, virulence of microorganisms, immunity, natural resistance, pre-immunization, mechanism of immunity, phagocytosis, analysis of phagocytic processes, antigens and antibodies, theory of immunity, specificity of antibodies, opsonin and tropinin, lysis, agglutination, thrombocytology, antitoxins, precipitins, flocculation and allergy. Those of the section on virus disease are:—historical review, growth of viruses, morphology, chemistry, metabolism, biology, filtrable viruses, ultra-viruses, paths of infection, virus *in vitro*, diagnosis of disease, cultures, immunobiology, acquired immunity, allergy in re-infection, and active immunization. Those of the section on epidemiology are:—general review, aetiology, pathology, epidemiology, biological factors, cells, methods of infection, origin of epidemics.

The subjects are briefly dealt with and the book, printed in cyrillic characters, is paper bound.—F.A.A.

STATHER, G. (1950.) Tierarzneimittel Rezepte. [Veterinary pharmacopoeia.] pp. 137. Stuttgart: Wissenschaftliche Verlagsgesellschaft. m.b.H. DM. 9.30. 3186

This is a collection of veterinary prescrip-

tions for the pharmacist. There are prescriptions for various diseases and conditions in horses, cattle, sheep and goats, pigs, dogs, cats, rabbits and fowls. The section headed "Miscellaneous" contains, among others, prescriptions for diseases in fishes and bees, treatment of wounds, and preparation of repellents and licks.

The booklet is well bound and the print is good.—E.G.

BORRELLI, G. (1949.) Chirurgia suina. [Surgery in pigs.] pp. 426. Guardigliare, Italy: A. G. Palmerio. 3187

The text of this book does not contain anything new, and much of it is merely a repetition of well-established principles applicable to the surgery of any animals. It is however profusely illustrated with drawings and diagrams, and although these, at first sight, appear to be somewhat crude, on closer inspection they prove to be illuminating and helpful both in giving considerable detail of the anatomy of the part concerned and the surgical method described. About a quarter of the book is devoted to restraint and anaesthesia. Castration and spaying and various malformations occupy another half. The diagrams are excellent. The remainder of the book deals with Caesarian section, prolapse of the uterus and rectum, and removal of the udder, inexplicably mixed with such minor operations as injections (subcutaneous, intravenous and subdural), bleeding, cutting of tusks, ringing and ear marking. This is a very useful book.

—R. MACGREGOR.

KÜHN, A. (1949.) Grundriss der allgemeinen Zoologie. [Outline of general zoology.] pp. vii+281. Stuttgart: Georg Thieme. DM. 15.60. 3188

This revised and enlarged edition of Kühn's textbook contains essential information for students of biology in clear and concise German with numerous useful schematic illustrations. A number of the older diagrams have been substituted by more up-to-date ones and over 50 new illustrations have been added. Many essential alterations have been made in the text, particularly in the chapters on evolution and heredity. There is a subject index and a bibliography. Print, paper and binding are of good quality.—E.G.

ZORN, W. (1949.) Stallverbesserung und Stallneubau. [The improvement of defective stables.] pp. 34. Stuttgart: Eugen Ulmer. DM. 1.50. 3189

A brief outline on how to improve on common defects of stables, illustrated with five diagrams and one photograph.—E.G.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review.]

- AKAZAWA, S., HAGA, T., HAMADA, S., HIRATO, K., KASAI, K., KOHANAWA, C., MIURA, S., NISI, T., ONO, Y., SOEKAWA, M., SUTO, H., TAJIMA, Y., TATEZAWA, E., UEDA, S., YAMAGIWA, S., & YAMASHITA, J. (1949.) **[Equine infectious anemia.]** Vol. I, pp. vi + 264. Vol. II, pp. v + 172. Tokyo: Ministry of Agriculture and Forestry, Livestock Bureau. [In Japanese.]
- ALBIEN, W. (1948.) Was gibt es Neues für den praktischen Tierarzt? **[Matter of interest for the veterinary practitioner.]** pp. 520. Hannover: Schlütersche Verlagsanstalt und Buchdruckerei. DM. 20.
- BATES, M. (1949.) **The natural history of mosquitoes.** pp. xv + 379. New York: The Macmillan Co.; London: Macmillan & Co. Ltd.; Toronto: The Macmillan Co. of Canada, Ltd. 25s. 6d.
- BAUER, H. R. (1950.) Ferkelverluste. Eine Züchtungshygiene für Tierzüchter und Tierärzte. **[Mortality in young pigs.]** pp. 140. Hannover: M. & H. Schaper. DM. 5.80.
- BELLER, K., & BIELING, R. (1950.) Viruskrankheiten. Zweiter Teil. Die Viruskrankheiten der Haus- und Laboratoriumstiere. Ihre Erreger und ihre Bekämpfung. **[Virus diseases. Part II. Virus diseases of domestic and laboratory animals.]** pp. viii + 278. Leipzig: Johann Ambrosius Barth. 2nd Revised Edit. DM. 12-60.
- BELSCHNER, H. G. (1950.) **Sheep management and diseases.** pp. x + 718. Sydney & London: Angus & Robertson. 75s.
- BLOM, E. (1950.) Om bedømmelsen af tyresperma. Specielt med henblik på anvendelsen ved den kunstige sædoverføring. **[On the evaluation of bull semen with special reference to its employment for artificial insemination.]** pp. 223. Copenhagen: Carl Fr. Mortensen.
- BOOKER, C. G. (1949.) **Public health bacteriology and parasitology.** pp. xiii + 254. Johannesburg: L. S. Gray & Co. (Pty.) Ltd. 35s.
- CUSTER, R. P. (1949.) **An atlas of the blood and bone marrow.** pp. x + 321. Philadelphia & London: W. B. Saunders Co. 75s.
- DOFLEIN, F., & REICHENOW, E. (1949.) Lehrbuch der Protozoenkunde. **[Textbook of protozoology.]** pp. 408. Jena: Gustav Fischer. 6th Edit. DM. 21.
- FORSYTHE, S. M. (1949.) **The story of bovine tuberculosis.** pp. xv + 179. London & Melbourne: Oak Tree Books, Ltd. 10s. 6d.
- GREEN, D. E., & KNOX, W. E. (Edited by) (1950.) **Research in medical science.** pp. viii + 492. New York: The Macmillan Co. 48s.
- HARRIS, H. J. (1950.) **Brucellosis (undulant fever). Clinical and subclinical.** pp. xxiv + 617. New York: Paul B. Hoeber, Inc. 2nd Edit. revised and enlarged. \$10.00.
- HICKS, S. P., & WARREN, S. (1950.) **Introduction to neuropathology.** pp. xiii + 494. New York, Toronto & London: McGraw-Hill Book Co., Inc. 1st Edit. 85s.
- KRUMBIEGEL, I. (1948.) Beiträge zur Hygiene und Epidemiologie. Heft 3. Eurasische Mäuse als Seuchenüberträger, ihre Verbreitung und geomedizinische Bedeutung. **[Mice as carriers of diseases.]** pp. vi + 89. Leipzig: Johann Ambrosius Barth. DM. 12.
- LIEGEOIS, F. (1949.) Traité de pathologie médicale des animaux domestiques. **[Pathology of domestic animals.]** pp. xxv + 926. Paris: Librairie Agricole de la Maison Rustique. 3rd Edit.
- LUCK, J. M., LORING, H. S., & MACKINNEY, G. (Edited by). (1950.) **Annual review of biochemistry.** Vol. XIX, pp. xi + 596. Stanford, California: Annual Reviews Inc. \$6.00.
- MESSIERI, A., & MORETTI, B. (1950.) Corso di semiologia e diagnostica medica veterinaria. **[Symptomatology and veterinary diagnosis.]** pp. 562. Bologna: Libreria Universitaria di Lina Tinarelli. L. 4000.
- NEWBURGH, L. H. (Edited by) (1949.) **Physiology of heat regulation and the science of clothing.** pp. viii + 457. Philadelphia & London: W. B. Saunders Co. 37s. 6d.
- VON SCHMIDT, H. (1949.) Durch Insekten hervorgerufene Krankheiten. Ihre Hygiene und Klinik. **[Diseases caused by insects. Their prevention and clinical aspects.]** pp. 277. Stuttgart: Ferdinand Enke. DM. 30.
- WENDER, L. (1948.) **Animal encyclopaedia. Mammals.** pp. 266. London: George Allen & Unwin, Ltd. 12s. 6d.

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TECHNICAL COMMUNICATIONS, ETC.

Commonwealth Bureau of Animal Health, Weybridge.

Review Series No. 2. Modes of spread of *Streptococcus agalactiae* infection in dairy herds. A report on co-ordinated observations by the Agricultural Research Council of the United Kingdom. May, 1944 ... 3s. 0d.

Commonwealth Bureau of Animal Nutrition, Aberdeen.

15. Minerals in pasture. Deficiencies and excesses in relation to animal health. By F. C. Russell. May, 1944 ... 5s. 0d.

16. Diet in relation to reproduction and the viability of the young. Part 1. Rats and other laboratory animals. August, 1946 ... 6s. 0d.

Commonwealth Bureau of Animal Breeding and Genetics, Edinburgh.

The semen of animals and its use for artificial insemination. By James Anderson. Spring, 1945 ... 7s. 6d.

Commonwealth Bureau of Pastures and Field Crops, Aberystwyth.

36. The grasslands of Latin America. By Miss G. M. Roseveare. Late 1946 ... 20s. 0d.

38. Advances in grassland husbandry and fodder production. Second symposium. Late 1946 ... 6s. 0d.

Commonwealth Bureau of Plant Breeding and Genetics, Cambridge.

The new genetics in the Soviet Union. By P. S. Hudson and R. H. Richens. May, 1946 ... 6s. 0d.

Commonwealth Bureau of Soil Science, Harpenden.

43. Land classification for land-use planning. June, 1946 ... 4s. 0d.

Commonwealth Mycological Institute, Kew.

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